The Refrigeration Service Engineer

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Vol. 5
No. 11

NOVEMBER • 1937

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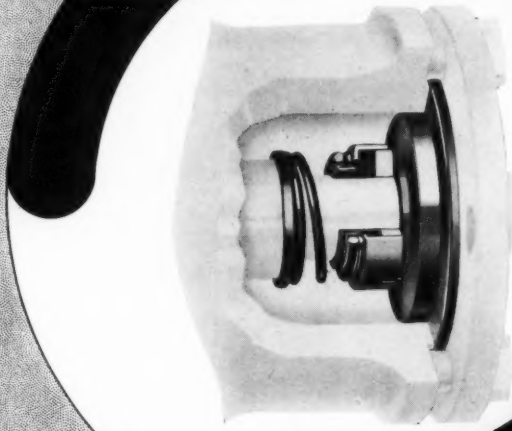

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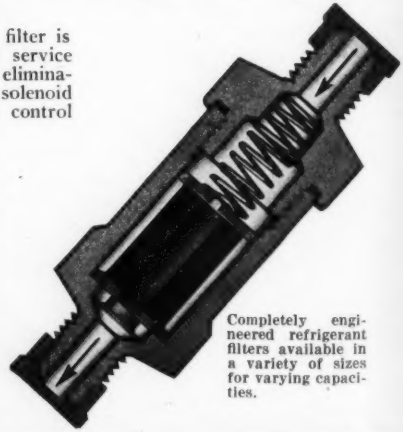

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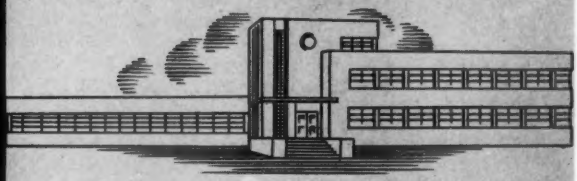

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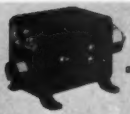

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The Refrigeration Service Engineer

Vol. 5 No. 11

November, 1937

A Monthly Illustrated Journal Devoted to the Interests of the Refrigeration Service Engineer in the Servicing of Domestic and Small Commercial Refrigeration Systems and Oil Burners

Official Organ
REFRIGERATION SERVICE ENGINEERS SOCIETY

COVER

This month's cover shows the refrigerated R.S.E.S. emblem, which was displayed at the recent Annual Convention, by Copeland Refrigeration Corp. Designed and built by Mr. Marvin Gammon, of the above company, the letters and circle surrounding them are made of copper tubing, which was refrigerated with a Copeland unit. The display was later presented to the Society.

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The Refrigeration Service Engineer

VOL. 5, No. 11 CHICAGO, NOVEMBER, 1937 $2.00 Per Annum

Fourth Annual R.S.E.S. Convention Surpasses All Expectations

2100 Registered Visitors to See 75 Beautiful Exhibits—Outstanding Educational-Entertainment Program Makes Fourth Convention a Highly Successful Meeting

AN eventful page in the history of the Refrigeration Service Engineers Society was written during the three days of November 3-4-5, and though no written record can ever do justice to the event as seen by those in attendance, it is the purpose here to give at least the highlights of what took place.

While the actual convention was confined to the dates mentioned, many visitors there for the occasion enjoyed a full week of entertainment, education and personal pursuits. Ideal weather, coupled with the holiday spirit of the thousands attending, brought to a successful conclusion, the year of hard work and effort of the Chicago Committee. Mr. Herman Goldberg and his hard-working committee are to be highly commended for the huge success they attained in their work.

The main attraction of the affair was the beautiful display of exhibits, totaling 74 in all, by a representative group of the parts and equipment manufacturers and jobbers. 2100 registered visitors viewed the exhibits and their complimentary remarks were many and varied. Many of the exhibits were of a highly educational nature, while others were of the humorous and entertaining type. The exhibitors, as a whole, did not spare their efforts or money in making their booths as interesting as possible.

Members upon registering were greeted with a pleasant surprise in the form of the Society's First Annual Year Book, which they received, together with a beautifully bound 16-page program of events for the three days

A departure from the usual procedure in the manner of handling the educational program was inaugurated this year in that papers were prepared and presented in printed form prior to the appearance of the speaker. Approximately 15 minutes were devoted by each speaker to an extemporaneous talk and the answering of questions on the paper. The two highlights of this program were the talk by Mr. G. E. Stedman, of the Cramer-Krasselt Co., Milwaukee, Wis., on the subject of "Merchandising," and the talking motion picture on "Heat and Its Control," by Mr. J. L. Patrick, of the Johns-Manville Corp.

The convention was called to order at 11 a. m., Wednesday, November 3, by Mr. Ivar Skipple, president of the Chicago Chapter. Extending a welcome to the members from all parts of the United States and Canada,

W. HALL MOSS, Memphis
President

CLAUDE A. BRUNTON
Huntington, W. Va.
First Vice-president

G. A. BURNS, Toronto, Can.
Second Vice-president

Mr. Skipple expressed the hope of seeing visitors from many other countries at future conventions.

Mr. Loran D. Gayton, city engineer of Chicago, was then introduced by Mr. Skipple as the official welcomer for the City of Chicago. Mr. Gayton, in extending the official welcome of the city, expressed the belief that the Society represented the most important industry of the day. Going back into history to just after the Civil War, he recalled the demands of our country and the task of our engineers were concerned with the building and development of our waterways.

After that came the building of our great railroad system, and the important man of that era was the Railroad Engineer. Next came the automotive industry, which in a comparatively short time was built up to a highly successful and the largest of all industries. Then the Highway Engineer came and did his part, as did the Radio Engineer, also, but most important today, and with the best prospects in view, are the Air Conditioning Engineers.

Mr. Gayton gave some interesting figures portraying the growth of air conditioning in the last three years, and then touched upon the problems of the city in meeting the increased demands on their water supply and sewage disposal systems due to air conditioning.

In closing, Mr. Gayton extended the offer of help from the city administration to anyone who cared to call upon it, and in any way they could be of service.

Mr. Skipple next introduced Mr. McKeague, from the Department of Steam Boilers, Unfired Pressure Vessels and Cooling Plants, who gave a brief glossary of what the City of Chicago was attempting to do through the code governing the installation and maintenance of refrigerating plants.

Next, Mr. Skipple introduced the National Officers for the benefit of any new members

C. O. McCAULEY, Pittsburgh
Member, Board of Directors

C. BUSCHKOPF
Beaver Dam, Wis.
Member, Board of Directors

FRED ROTH, Chicago
Member, Board of Directors

S. A. LEITNER, Kansas City
National Treasurer

H. T. McDERMOTT, Chicago
National Secretary

R. L. DARBY, Longbeach, Calif.
Sergeant-at-Arms

present, and then turned the gavel over to President Jacobsen, to conduct the meeting.

In assuming the Chair, Mr. Jacobsen addressed the assembly as follows:

President's Address

Gentlemen, this is the fourth time that we are gathered in annual convention, this time in the great city of Chicago, as guests of the Chicago Chapter.

The Society wishes to welcome the members that are here today. We sincerely hope every one of you will have such a good time you will all be back for the next convention.

The Society also wants to extend a welcome to the representatives of the Manufacturers' and Jobbers' Associations, to the guests of all the various states in the United States and Canada, and last, but not least, to our special friends, the Exhibitors.

The Society has made very fair progress in this past year. We have added twelve new chapters, and have from four to five chapters that are ready to sign up as soon as the convention is over.

We have all enjoyed a prosperous year, and I am sure when we count up what we have received from the Society we will find it to be a lot more than in the beginning of the Society.

You will hear reports from the National Treasurer and the National Secretary, and those reports will give you a much clearer picture of the gains that have been made in this past year.

There is one thing I want to mention as something new being given to you this year —that is this little Year Book. Our thought about the Year Book was to condense a lot of information all of us use every day into a small pocket size handbook, which we could carry along with us, so it would not be necessary to cram our heads with a lot of information as to various pressures and temperatures of gases. This little book, without a doubt, lacks a lot of being perfect. That we know, but I hope it will serve as a starter, and that every year we may be able

W. L. DRAKE, Indianapolis
Member, Board of Directors

C. P. EICH, Youngstown, Ohio
Member, Board of Directors

GEORGE H. CLARK, Chairman
National Educational and
Examining Board

to increase the size of this book until it comes up to the thing we expect and hope it should be.

As far as I, myself, am concerned, I want to say it has been a great pleasure to have been a National Officer this year, especially, because of the fact we have had such wonderful cooperation between the officers, and between the officers of the various chapters. They have all shown they were willing to do something for the Society, and I believe you will agree with me, this convention shows we have made a success of it this year. I sincerely hope you will enjoy the convention.

I see there are so many more people here this year than there have ever been before at one of our conventions, and I hope each one of you will go back and tell your brother engineers what it was all about and create an interest in the Society among these men, and make them all come to our next annual convention.

I don't believe a meeting of the Society would be complete without hearing a few words from one of the men who has, I might say, been the leading or guiding spirit over the Society from its very beginning. I'd like to introduce to you Mr. J. F. Nickerson.

Mr. Nickerson thanked the Society for their many cooperations, and expressed his gratitude in the large attendance evidenced at the meeting.

Jobbers and Manufacturers

President Jacobsen next introduced Mr. J. D. Colyer, president of the Refrigeration Supplies and Parts Manufacturers' Association, who extended the greetings of his association.

Mr. J. D. Merkle, the newly-elected president of the National Jobbers' Association, addressed the assembly as follows:

"Unfortunately, I did not know until just a few minutes ago that I was to have the privilege of addressing your organization. We, in the Jobbers' Association, have problems perhaps very much similar to yours.

"In an organization that has been in existence only a few years, in a comparatively new industry, we are faced with similar problems, and we can appreciate what you men are going through.

"I want to congratulate you upon the progress you have made, as evidenced by your attendance here and by your exhibits, because I have had an opportunity to compare what you have here as compared to previous conventions.

"In closing, may I extend to you the best wishes of the Jobbers' Association for a continued good measure of progress in the coming year."

The next order of business was the report of the National Officers, and first of these was the National Secretary, Mr. H. T. McDermott, whose report was as follows:

TO THE OFFICERS AND MEMBERS OF THE REFRIGERATION SERVICE ENGINEERS SOCIETY

In submitting the report of your Secretary's office to this convention in Chicago, it recalls a day in October, 1934. Chicago was then enjoying an event that is now but a memory—the second year of its World's Fair. The Refrigeration Service Engineers Society was a fact; however, little known with a few chapters formed in metropolitan areas, meeting as local groups much unto themselves, and a few scattered members-at-large. Although members of a National Society, little assistance could be expected from their National Organization because of its limited ability to render the service that it should. Those men who visualized the future growth of the industry realized that to extend the activities of the National Association and carry forth the purposes and objects as provided in its Constitution and By-Laws, the time had arrived to establish some semblance of a National Association. Every constructive move must have a beginning. So, in a measure, anticipating that the World's Fair might be instrumental in serving as an attraction for servicemen from out of the city, a call was issued for attendance at a Serviceman's National Convention. In a measure, it might be stated that it was hoped the World's Fair, as the principal attraction, would encourage some attendance at the first convention. After all, what attraction could a small struggling organization provide to secure a representative attendance? Nevertheless, the officers intelligently planned for that first meeting, providing an excellent educational program without any entertainment features. It was all business. The call was issued with a fervent hope that at least a corporal's guard would attend.

The convention was held on October 11, and many of those men who were in attendance at that convention are our active leaders today. Our first convention accomplished its purpose—today we witness the results of the seed planted at this first meeting, and return to Chicago with a representative National Organization. Comparing that first convention with our meeting today, what more can be said. Here we witness the completion of three constructive years of work since our first convention. Who can deny but a better understanding of the mutuality of interests exists today between the members of our organization, the suppliers of the materials we use, and the manufacturers of those materials. We can say that a more intelligent appreciation of each other's problems is, among other things, the direct result. In conjunction with our educational and business meeting, we have an outstanding manufacturers' exposition that would be a creditable showing for any organization much older in its years of activity. May I at this time encourage our members and guests to profit by this exhibit. There is a wealth of information and experience in refrigeration within the walls of this exhibit hall. It is an important part of our educational program.

Because the Society is attracting to the rolls of its membership those men who represent the outstanding men in the industry in their various communities, we desire to make this manufacturers' exposition truly what it deserves to be—a trade exposition that will provide a group of buyers, users and customers a convenient and profitable method of direct and personal contact with their sources of supply.

We welcome to our convention, and encourage the attendance of the manufacturers and jobbers who have so splendidly cooperated with us, and extend to them our best wishes that the deliberations at their meetings were fruitful of results. Let us all remember

that each of our associations have grown approximately in the same period of time. We anticipate their cooperation in our future efforts, which in the final analysis, must reflect in better conditions for the entire industry.

With the advancement of your National Society, and its consistent growth, the activities of your administrative office; that is, your Secretary's office, have increased proportionately. I know it will interest you to know that any proposal which has been submitted to your National Organization through its National Officers and Board of Directors, has been satisfactorily concluded. As this convention convenes, there is little left in the nature of unfinished business, thus providing clear decks for your National Officers for such business as may be introduced at this meeting and during the coming year.

Repeating again, as I have in previous years, the advancement of our organization is dependent upon the effective work of our constituent chapters. Speaking for your Officers, I know they have been guided in their work by one motive—how best to increase the value of the individual membership. It is also pleasant to learn of the many ways a number of our chapters have enhanced the value of chapter membership. To the end of strengthening our individual chapters, and to assist in carrying forth in a more substantial and instructive way, the work of our chapters, this National Organization should continue and enlarge the scope of its activities for this purpose wherever possible. I believe a start has been made this year.

It will be interesting to learn from the reports of delegates of the manner in which the lecture course has been used as the basis of study in the local chapters. Further, our Certificate Membership has not increased proportionately this year, and it is the hope of your National Officers that more local chapters will conduct examinations for Certificate Membership, and that the chapters will interest their members in taking this Certificate Examination.

Speaker's Bulletin

This year, we established a Speaker's Bulletin, which was issued to the local Educational Chairmen, endeavoring to supply them with information from those sources who had indicated to your National Society, their willingness to supply educational talks for the local chapter meetings. May I say that meetings of the chapters should be planned to encourage for these particular features, as large an attendance as possible. Oftentimes, it provides a good opportunity to invite prospective members when such an outstanding meeting is to be held, so that they may recognize the advantages of chapter membership. It is a fine courteous gesture to the speaker to have as large an attendance as possible, and would justify the expense to which many of the manufacturers are put in sending engineering specialists long distances to attend our chapter meetings.

Again, your National Officers have contributed unselfishly of their time in the interests of your Association, and have taken the initiative in the formation of new chapters, and other means intended to increase the service of your National Association.

The success of this convention, and the completeness of the arrangements bespeak the tremendous job well done by our hosts for this meeting. President Skipple and the members of Chicago Chapter, Mr. Herman Goldberg, convention chairman, and his able committee consisting of Messrs. Irving Alter, H. W. Blythe, B. B. Dawes, Harry Drownes, George Franck, William Hauber, R. L. Hendrickson, Ray Johnson, George Monjian, Ray Polley, Fred Roth, E. W. Scotten and Willis Stafford, have established another mark that will be difficult to exceed for our succeeding conventions. I know that I bespeak the appreciation of our entire membership to our hosts and the committee.

Your Society is again in a position to report that its financial stability has increased with the passing year. A successful organization must, of course, be in a position to meet its bills currently, and should certainly be financially in a position to undertake some work in the interest of its members, where such activity might require the expenditure of money to do this work. As you will recall, a revised Constitution and By-Laws were adopted at our Memphis Convention, and among the new provisions, it places the fiscal year of your Society on the basis of July 1 to June 30 of each year. Consequently, your Secretary's financial report will cover the period from the date of our last audited financial report, October 31, 1936, to the end of the fiscal year of June 30, 1937—a period of eight months. Our report of October, 1936, showed a cash balance on hand as of that date of $1923.15, with some bills payable incurred for the holding of our Memphis Convention. The eight-month period of November 1, 1936, to June 30, 1937, shows a cash balance on hand of $1188.51. Since June 30, of course, our per capita tax has been due and payable, which has and is being paid by our chapters and members-at-large, as well as the receipts for exhibit space for this convention. The changing of our fiscal year has, of course, made necessary the change of records in our local chapters, and while there has been some confusion in the payment of dues, I anticipate that this matter will be entirely straightened out at the end of this fiscal year. Therefore, a supplementary report indicates a cash balance on hand on October 31, 1937, of $6259.22, which, of ccurse, expenses of this convention will be deductible therefrom. Here is another graphic picture of progress as evidenced by your Society, and will place your Society in a financial position to undertake, as I have stated before, further work which may require the expenditure of money.

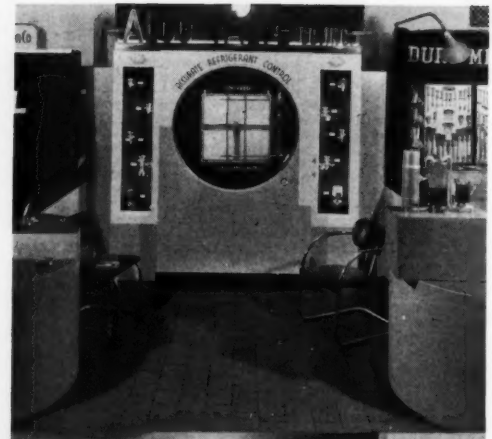
How the Society Saves Money

It is interesting to know how your National Organization accomplishes this financial record in view of the nominal receipts which it secures. It will bear repetition that no officers of your National Society receive any compensation for service. While the affairs of your Society require the employment of a stenographer for full time, we have indeed been most fortunate in the contribution of this time, as well as the time required by your National Secretary, as well as executive headquarters and the facilities available of a modern business office, through the generosity of the publisher of our official organ, Mr. J. F. Nickerson, whose interest and foresight in the starting of this Society is manifest today.

The space provided for the activities of our Society in our official organ has again been instrumental in extending the work of the Society nation-wide, as well as in foreign countries. It has served to keep our chapters closely related by the publication of chapter news and other events.

Our educational work, under the capable supervision of our National Educational Chairman, has continued this year, and the Secretary's office has been the recipient of many letters indicating the value of this educational material to the membership. Mr. George H. Clark, of Detroit, our Educational Chairman, has been responsible for the answering of an increasing number of individual problems confronting our members, which have been promptly attended to, and have constituted a service that would be hard to estimate in an actual dollars and cents value.

Our uniform cost accounting forms, com-



piled by Mr. Harry Drownes, of Chicago, and which have been adopted by the Society in the interests of more intelligent business management, are in use by some of our members. As the value of this form becomes more generally recognized, I feel confident of its more universal use.

At this convention, we shall briefly hear of the activity of your Society in a Unit Labor Survey, which will be conducted and the work that has been inaugurated thus far.

In my report at our 1936 convention, our Society had at that time 20 chapters. It was the object of your National Organization to establish 12 new chapters. I am pleased to report that our goal in this respect has been attained. Twelve new chapters have been added to our roster, consisting of: St. Joseph, Mo., Chapter; Central Indiana Chapter; Columbus, Ohio, Chapter; Dayton, Ohio, Chapter; Long Beach, California, Chapter; Colonel's Chapter, Louisville, Kentucky; Madison, Wisconsin, Chapter; Magnolia Chapter, Jackson, Miss.; Mississippi Valley Chapter; Montgomery, Alabama, Chapter; Toledo, Ohio, Chapter; Tri-County Illinois Chapter. The formation of these chapters is further evidence of the work that has been accomplished by your National Officers, and membership in sponsoring these groups.

November 11, 1936—At our Memphis Convention, a petition for charter for St. Joseph Chapter was presented by Mr. E. J. Storm, temporary president, and reported at that convention. This chapter was assisted in its formation by our National Treasurer, Mr. S. A. Leitner, of Kansas City. On June 1, 1937, Mr. Leitner journeyed to St. Joseph, Mo., and presented the charter to this chapter. Accompanying Mr. Leitner were eight members of Kansas City Chapter.

December 11, 1936—Servicemen comprising the Tri-City area of Davenport, Iowa, Rock Island and Moline, Illinois, and surrounding territory, met at the Hotel Davenport at a special meeting arranged through the courtesy of Mr. E. L. Bengston, of the Republic Electric Company. Your National Secretary met with this group, and a petition for charter was presented to the National Organization, and election of temporary officers held. At a special meeting on February 12, the charter for the chapter, which had selected the name of Mississippi Valley Chapter, was presented by your National Secretary.

January 20, 1937—Upon application of a group of service engineers from Montgomery, Alabama, the National Society has chartered Montgomery Chapter as a regularly constituted body of our National Society.

February 25, 1937—A group of servicemen from Columbus, Ohio, met at the headquarters of the Hughes-Peters Electric Corp. to consider the formation of a local chapter. Mr. Warren Farr, member of the National Board of Directors, with Past-President James Downs and Mr. K. P. Wall, secretary of Cleveland Chapter, journeyed to assist in the formation of this chapter. It was decided on this evening to petition for a charter, which was duly forwarded to Association headquarters. On March 25, National President Jacobsen attended the meeting of Columbus Chapter to assist further in the work of its organization. On April 27, President Jacobsen presented the charter to Columbus Chapter. The Society appreciates the cooperation, in the formation of this chapter, of Messrs. C. E. Graff, J. D. Merkle and R. R. Dunlop, of Ranco, Inc., and the Hughes-Peters Electric Corp., for the arrangements provided for the various meetings during the formative period.

Top—Alco Valve Co., Inc., St. Louis, Mo.
Center—Ansul Chemical Co., Marinette, Wis.
Bottom—Commercial Coil & Refrigeration Co., Chicago.

March 16, 1937—Through the efforts of National President, Paul Jacobsen, a group of servicemen in the Central Indiana territory met, and petitioned a charter for Central Indiana Chapter, and because the chapter would necessarily cover various points in Central Indiana, it was decided to hold meetings at the various cities in which the membership was interested. Subsequently, on May 18, President Jacobsen presented the charter to Central Indiana Chapter.

May 11, 1937—The National Society has been particularly pleased to have its first Pacific Coast organization recorded. Our first Pacific Coast chapter is Long Beach Chapter, of Long Beach, California. A group of service engineers, interested in the purposes and objects of the Society, meeting as a local group for due deliberation, petitioned to affiliate with the Refrigeration Service Engineers Society. We have represented with us at this convention, the delegate for this chapter, from whom, no doubt, we shall hear later on in the convention.

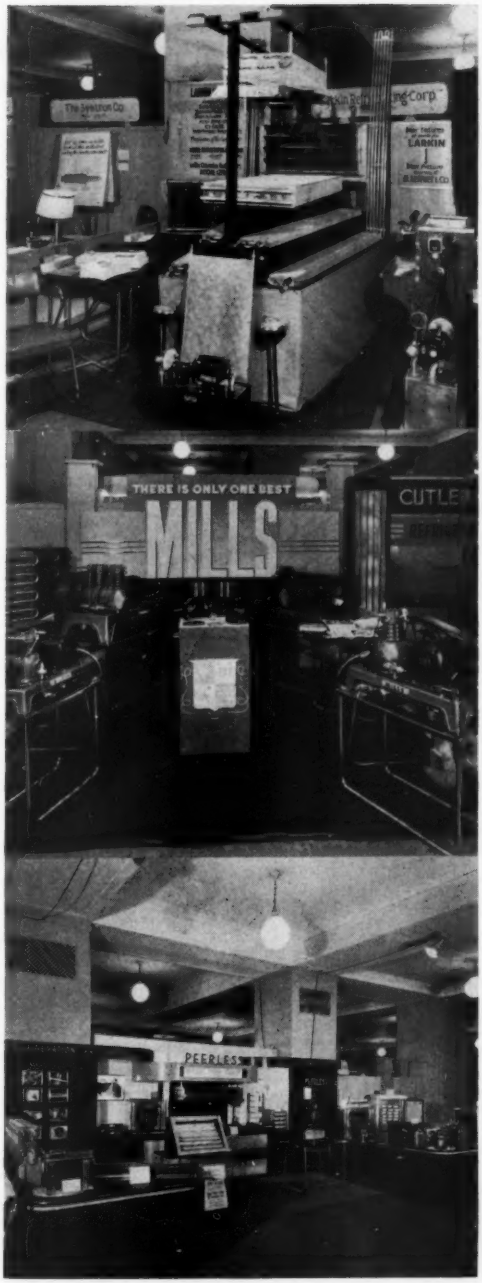
July 2, 1937—Our Vice-President, Mr. W. Hall Moss, of Memphis, journeyed to Jackson, Miss., to assist in the formation of a local chapter at that point. Vice-President Moss, meeting with this group, explained the purposes and objects of the Society, and a petition for charter was presented. Magnolia Chapter represents another link in our organization in the South. Mr. H. E. McAdams, of Enochs Sales Co., contributed much to the preliminary arrangements for this chapter.

July 14, 1937—A meeting of servicemen from the counties of DuPage, King and Will, held in Elgin, Illinois, was arranged through the efforts of Mr. Willis Stafford, secretary of Chicago Chapter. Your National Secretary met with this group, and a petition for charter was granted by the National Society. Mr. Willis Stafford, acting as special representative of the National Society, presented the charter to this Illinois chapter on July 21, in Aurora, Ill.

August 26, 1937—A group of servicemen in Toledo, Ohio, met in several meetings prior to the organization meeting of this chapter, and on August 26, your National Secretary met with this group to explain the purposes and objects of our Society, and immediately thereafter, an application for charter, signed by 24 members, was presented. The charter for this new chapter will be presented shortly after this convention. One of our early members-at-large, Mr. A. J. King, was elected President.

September 27, 1937—Through the arrangements and cooperation extended to our National Board Member, Mr. C. Buschkopf, of Beaver Dam, Wisconsin, by Mr. Gustave A. Larson, of the Gustave A. Larson Company, Madison, Wisconsin, a dinner meeting was sponsored at the Park Hotel, to consider the formation of a chapter of servicemen at this point, to comprise the men engaged in the servicing business in Madison and surrounding territory. A very interesting meeting was held, at which your National Secretary was present and received the assistance of Mr. G. D. Wang, of Milwaukee. A petition for charter was signed by those present that evening, containing the names of 20 members. This chapter will receive its charter in the near future.

September 30, 1937—Through the courtesy and arrangements of Mr. Arthur Dehler, of Geo. Dehler, Jr., & Co., of Louisville, Kentucky, a meeting of servicemen in this territory was held, and after the purposes and ob-



Top—Larkin Refrigerating Corp., Atlanta, Ga.
Center—Mills Novelty Co., Chicago.
Bottom—Peerless of America Inc., Chicago.

jects were explained by your National Secretary, a petition for charter was presented, 34 members signed the application for charter, and Louisville Chapter will probably be known as Colonel's Chapter, of Louisville, Kentucky. The charter for this chapter will be presented at an early date.

October 8, 1937—Through the efforts of Mr. T. C. Bickel, of Allied Refrigeration Parts, Dayton, Ohio, a meeting of a group of servicemen was held in Dayton, Ohio, to ascertain the number of prospective members interested in the formation of a chapter. At this meeting, Mr. William L. Drake, president of Indianapolis Chapter, was in attendance to assist in the formation of this new organization. The result of the deliberations of this group was the forwarding of a petition for charter to the National Secretary's office. 21 men signed the petition for charter.

As we consider the standing of our chapters, we find that our Canadian brothers across the border, carry first honors for the largest chapter—Ontario Maple Leaf Chapter, of Toronto, having as of this date 111 paid-up members. The state of Ohio has the distinction of having the greatest number of chapters, a total of seven. Incidentally, Ohio has further been instrumental in the establishment of our first State Organization. On February 27, 1937, a charter was applied for, signed by the following Ohio Chapters—Cleveland, Youngstown and Akron. Subsequent meetings were held, and the State Charter presented by Mr. Warren W. Farr, a member of our National Board of Directors. More complete organization details of this State Association have been recently perfected, and officers elected consisting of: Mr. Chas. Eich, Youngstown, Ohio—State President; Mr. Martin Bokesch, Sr., Youngstown, Ohio—State Secretary; and Mr. R. E. Yeager, Columbus, Ohio—State Treasurer.

Your Secretary's office has just received the application for a State Charter for Wisconsin, signed by Milwaukee and Madison Chapters, the officers of this State Association including: Mr. G. D. Wang, Milwaukee, Wisconsin—President; Mr. Gustave A. Larson, Madison, Wisconsin—Secretary; and Mr. Glen Reynolds, Portage, Wisconsin—Treasurer.

The formation of our State Associations will tend to bring closer relationship to the chapters in the State, and they are in a most desirable position to extend the activities of your National Society. State organizations can be of much help in strengthening weaker chapters and assisting in the supervision of the educational advancement and to act concertedly on problems of a State nature.

At this convention a petition for charter for a chapter at Huntington, W. Va., has been presented by Mr. Claude Brunton, our National 2nd Vice-President.

Like any association, our National Organization has been confronted with a turnover in membership. This is particularly true in the formation of an organization as young as ours, and has been experienced by other associations in their earlier years. However, of the utmost importance in your Secretary's opinion, is that this organization today is attracting and holding the membership of men who are responsible for the advancement the servicing business has enjoyed, and are vitally interested in establishing the business on a permanent substantial basis.

Our annual Year Book, which is distributed to each member at this convention, lists the names of 1,016 members. It is particularly

Top—Dayton Rubber Mfg. Co., Dayton, Ohio.
Center—R. & H. Chemicals, Wilmington, Del.
Bottom—Kerotest Mfg. Co., Pittsburgh, Pa.

pleasing to know that as our chapters have progressed, they have become firmly convinced that the strength of our organization is not necessarily in the quantity of our membership, but rather in the quality, and the membership requirements in many of our chapters have, therefore, been made stricter and more selective in the members admitted. This practice is having a most wholesome effect.

This year marks the publication of our First Annual Year Book, the publication of which was decided upon by the Board of Directors at our last convention, and your National President has carried this work through to a successful conclusion, in the publication of this book. Unquestionably, there will be many suggestions for the improvement in the publication of future editions, but I am confident you will agree that it represents the start of another service to our members that will be of immeasurable value as the years pass.

Again, this year it has been your Secretary's experience to have the fine cooperation of the National Officers. When called upon, they have never been found wanting, and it would be most difficult to single out one person without mentioning the entire group that have devoted their time unstintingly, in furthering the interests of your organization. President Paul Jacobsen has initiated moves this year that will undoubtedly constitute outstanding educational features in future years. He has actively engaged in the administrative policies of your Society, and has visited with individual chapters insofar as his time would permit. Your Secretary's office is more than pleased to again report the splendid cooperation that we have received from the manufacturers and jobbers in the industry, who have when called upon, graciously cooperated with this organization, and I express the appreciation of our organization to them for this cooperation.

In closing, may I say on behalf of your National Officers that the work accomplished this year would not be possible if it were not for the splendid cooperation and support we have enjoyed from our membership. May our deliberations at this convention be a further impetus to this organization's progress, and the proposals and recommendations be constructive in their purpose for the guidance and direction of the National Officers you shall select for the coming year.

Gentlemen, it is your convention—your Society. May its record during the coming year reflect credit to the industry we represent.

Treasurer S. A. Leitner, of Kansas City, then submitted the Treasurer's report, confirming the financial report by the Secretary.

Committee Reports

Mr. Geo. H. Clark, in reporting for the National Educational Board, stated that the educational bulletins were going forth with more or less regularity, and would continue in the future.

Mr. H. A. Drownes, in reporting for the Uniform Cost Accounting Committee, stated that while some of the members were using the Society's service forms, there were not sufficient as yet to report anything of value on the operation of these forms.

Top—Ranco Inc., Columbus, Ohio.
Center—Tecumseh Products Co., Tecumseh, Mich.
Bottom—Virginia Smelting Co., West Norfolk, Va.

Mr. Joe Askin, reporting for the Symbols Committee, stated that no further progress had been made on the symbols to date, due to the great amount of red tape it was necessary to go through in order to get new symbols adopted by other societies concerned, and he made a motion that the symbols as produced in the First Annual Year Book be adopted for use by the National Society. The motion was seconded, and duly carried. In closing, Mr. Askin expressed himself as follows:

"I suggest that you gentlemen make it a habit to use these symbols in laying out refrigeration systems that you may be bidding on, or in laying out installations which you or your servicemen may have to install. In writing to Mr. Clark, of the Educational Committee, regarding information on a certain installation, I would suggest you make it a habit to use these symbols in laying out your installation. In that way, we will become more acquainted with the symbols, and will have a common language to talk in dealing with refrigeration problems."

The Unit Labor Survey

The next committee report came from Mr. P. B. Reed, on the Unit Labor Survey as follows:

"The Society has undertaken to develop a system, the purpose of which is to permit a more accurate means of estimating in advance the labor cost of an installation or a service operation.

"Those of you who have had occasion to call for an electrical bid, particularly, wiring, have perhaps become surprised at the uniformity of the bids received from the various electrical contractors. You have perhaps suspected collusion. I think in most instances, however, that has not been true.

"The electrical contractors, for the most part, have practically identical costs on their materials. They have, however, developed a system of estimating labor that is so accurate that necessarily their estimate of the total amount of labor required for a job is also quite accurate and it follows, therefore, that the total estimate of the job, including labor and material, runs very close together.

"Some years ago the Association of Electragists, which is an association of electrical contractors, proposed and carried forth a survey to develop a similar system to this one that we propose.

"They sent out to their members, and to other sources who were able to give them the data they required, questionnaires to be filled in, showing the amount of labor required for each unit of operation.

"After a considerable amount of data was collected and compiled and put in usable form, they had this set of tables developed and published to their members.

"Those members are now able to take those tables along with their bill of materials, and its use is something like this: they go to a job and either look at the job itself or take their information from the blue prints, and set down their bill of material, of what material will be required. Alongside of those materials they put down the cost of the materials per unit and extend them. Still further over, on the same paper, they put down the unit of labor for each one of those materials. For instance, if they have 100 feet of No. 14 wire, they put down the labor unit for that size wire in that length. Then they extend that. As a result, when they get done they can total up their material, total up the number of hours labor, cost of labor, and they come out awfully close to being right.

"It appears to me that this Society is probably best able to develop such a system, and its value to you and the rest of the industry is obvious."

President Jacobsen then appointed the convention committees as follows:

Nominating Committee

Mr. C. P. Eich, Youngstown, Ohio—Chairman.
Mr. R. F. Weidlein, Memphis, Tenn.
Mr. G. D. Wang, Milwaukee, Wis.
Mr. M. H. Hamilton, Washington, D. C.
Mr. Geo. O'Hara, Buffalo, N. Y.

Auditing Committee

Mr. Ivar Skipple, Chicago, Ill.
Mr. H. H. Shuell, Louisville, Ky.
Mr. H. E. Young, St. Joseph, Mo.

Resolutions Committee

Mr. E. V. Black, Pittsburgh, Pa.
Mr. R. L. Darby, Long Beach, Calif.
Mr. W. G. Euth, Detroit, Mich.
Mr. T. C. McKee, Toronto, Ontario, Can.
Mr. T. A. Weichel, Cleveland, Ohio.

The meeting adjourned at 12:35 p. m.

Second Day—Thursday, November 4

The second session of the convention was called to order at 10:25 a. m., November 4, by President Paul Jacobsen.

First on the program was Mr. G. H. Clark, who conducted the Question Box. Some very interesting questions were brought up by the members, and thoroughly discussed and answered by those attending the meeting or by Mr. Clark. These discussions will be published in a future issue.

The first feature of the educational program was then presented by Mr. J. L. Patrick, of the Johns-Manville Corp., who presented for the extreme enjoyment of the assembly, a talking motion picture on the subject of "Heat and Its Control." In the few remarks prior to the showing of the film, Mr. Patrick stated:

"In a few moments we are going to show you the Johns-Manville talking motion pic-

ture, 'Heat and Its Control.' As far as we know, it is the first sound motion picture ever produced on this important subject, and we assure you that the great amount of research and investigation that went into the preparation of it, has proved to us that the value of this picture may be even greater than we thought when we first decided that the picture should be made. However, you can be the judge of that after you see it.

"Life, as we all know, can exist without sound, light or electricity, but not without energy in the form of heat.

"Industry, of course, is the child of energy and there perhaps is none of us here today who has not long been aware of the need for the control and conservation of heat in order that the swiftly mounting volume of work which industry performs can be handled at increasingly lower costs, with greater efficiency and under more accurate control.

"Johns-Manville, as a leading manufacturer of insulating materials, has been concerned with this problem for more than 70 years now, and maintains a large Insulation Research Laboratory which does nothing else but seek new knowledge on this subject and develop new materials to meet increasingly exacting needs of industry in this field.

"In view of these facts, we believe that Johns-Manville was the logical organization to utilize the great possibilities presented by the medium of the talking motion picture to produce this first comprehensive dramatization of the history, the theory and the properties of heat, and the progress which man has made in bringing this most powerful force of nature under control.

"We hope that you are going to find this picture most helpful and entertaining."

Heat and Its Control

This picture was by far the most outstanding industrial educational film ever shown to such an assembly. The enthusiastic applause accorded it expressed the feeling of the members in general.

After the showing of the film, Mr. Patrick again expressed himself as follows:

"It just occurs to me that you might like to know a little more about how this picture was made. Although it took us only 45 minutes to see it here today, it required more than a year of preparation and actual production to show it in this form."

Mr. Patrick went on to describe some of the obstacles and difficulties encountered in the making of the film and how they were overcome.

The next educational feature of the program was the paper presented by Mr. W. D. Ambrose, service manager of Mills Novelty Co., on the subject of the "Independent Service Organization and a National Organization." Mr. Ambrose described his paper almost word for word as it appears in the printed form, and will be published in these columns at a future date.

Talk by G. E. Stedman

A highlight of the educational program, which came next, was the talk by Mr. G. E. Stedman, of Cramer-Krasselt Co., on the subject of "Merchandising." In the course of his talk, Mr. Stedman stressed such points as: How the sales organization depends on the service organization; the fact that we are not selling a product, but satisfaction; the somewhat new idea (at least to us) that we are doing the public a service in selling an appliance through the fact that we are helping to raise the standard of living conditions in the home. Mr. Stedman brought out the thought that just because the stock market has taken a slump at this time, there is no indication of a slump in business. All economic indices are up, and, therefore, business should increase. Compared to 1932, there will be, at the end of this year, $12,000,000,000 more buying power. He advocates forgetting the competition and price-cutting, and suggests that our efforts be confined entirely to doing a conscientious job with the feeling that we are rendering a service to the public. In giving a formula for a successful sale, Mr. Stedman mentioned four points, or ingredients, which are necessary: First, you have to sell the need; second, you must give a complete and dramatic description of the product features; third, stress the vital differences in your service or your product; fourth, justify the purchase or the service cost in relation to the fact that it saves the customer money. In closing, Mr. Stedman stressed the fine opportunity a service organization has of selling appliances after the serviceman has gained entry to the home through service. The general opinion of the assembly, borne out by the enthusiastic applause given Mr. Stedman, was that his talk was a headliner of the entire program.

Next on the program was Mr. Joe Askin, chief engineer of the Fedders Manufacturing Co., who presented his paper entitled, "Heat Transfer Surfaces for Refrigeration." While Mr. Askin did not attempt to read his paper in the short time allotted to him, he commented on the high points of the paper, and answered questions from the assembly. The paper in full will appear in this magazine at an early date.

The next order of business was the report of the Nominating Committee, which was read by the Committee Chairman, Mr. Eich. After Mr. Eich's report was the election of officers for the ensuing year. Following the usual procedure of receiving additional nominations from the floor and voting on each officer individually, the final outcome of the election was as follows:

New National Officers

President—W. Hall Moss, Memphis.
1st Vice-president—C. A. Brunton, Huntington, W. Va.
2nd Vice-president—G. A. Burns, Toronto.
Secretary—H. T. McDermott, Chicago.
Treasurer—S. A. Leitner, Kansas City.
Sergeant-at-Arms—R. L. Darby, Long Beach.
Board of Directors—C. Buschkopf, Beaver Dam, Wis.; W. L. Drake, Indianapolis, Ind.; C. O. McCauley, Pittsburgh, Pa.; C. P. Eich, Youngstown, Ohio; Fred Roth, Chicago.

Third Day—Friday, November 5th

The final session was called to order at 10:25 a. m., by Past President Paul Jacobsen, and was immediately turned over to Mr. Geo. Clark, who conducted the Question Box. Some very interesting problems in refrigeration were brought up by the assembly and thoroughly discussed, requiring considerably more time for this feature than was planned on the program. A résumé of these questions and the answers given will appear in a future issue.

At this time, the newly-elected president, Mr. W. Hall Moss, took over the gavel to conduct the remainder of the meeting. He introduced as the next educational feature, Mr. D. D. Wile, chief engineer of Refrigeration and Air Conditioning, Detroit Lubricator Co., who presented his prepared paper on the subject of the "Service Analyzer." Devoting fifteen minutes to generalities in regard to his paper, Mr. Wile concluded by answering a number of questions from the floor. His paper in full will appear in an early issue.

Next on the program was the paper presented by Mr. W. S. Bodinus, of the Carrier Corp., on "The Typical Air Conditioning Job and the Service Man." Mr. Bodinus' paper dealt primarily with the part played by the serviceman in the air conditioning installation, and then devoted considerable space to the Carrier Corporation's Psychrometric Chart and specific examples and problems relating to its use. This paper, in full, will appear in a future issue.

Next on the program was a motion picture presented by Mr. J. B. Talley, of the Frigidaire Corp., portraying the operation of a thermal expansion valve—a highly educational film showing the operation of the entire system and the flow of the gas through the expansion valve during different operating periods of the system. Following the picture, a number of questions concerning Frigidaire expansion valves were asked from the floor, and satisfactorily answered by Mr. Talley.

Next on the program was the paper on "Application of Controls to Commercial Refrigeration," by Mr. A. B. Newton, of the Minneapolis-Honeywell Regulator Co. Mr. Newton's paper gave a very comprehensive outline of the various combinations of controls, and the satisfaction that can be expected from these combinations, as applied to commercial refrigeration. He stated in closing that the control system of today still leaves much to be desired, but that rapid development was fast overcoming the deficiencies at this time. His paper, in full, will appear in a future issue.

Mr. Moss then called for the report from Mr. Skipple, chairman of the Auditing Committee, which was given as follows:

Report of Auditing Committee

It has been very satisfying to note the care that has been given to the detail of carrying the accounts of the Society.

It indeed pleases us to note the reasonable prices that have been secured on the occasional small purchase orders.

The general increase in the Society funds this year assures our success and indicates that the management by the General Board has been intelligently handled.

Examination has been made of the receipts and disbursements of the Secretary of the Refrigeration Service Engineers Society for the period extending from November 1, 1936, to June 30, 1937 (an eight-month period).

We, members of the Auditing Committee, certify the figures as presented to us to be correct, showing a balance of $1923.15 on hand at the beginning of the period and a cash balance of $3122.74 at the end of the period.

ASSETS (Current)		
Cash in Bank	$3102.74	
Cash on Hand	20.00	
Accounts Receivable	69.17	
TOTAL ASSETS		$3191.91
LIABILITIES		
Accounts Payable	$ 38.45	
NET WORTH		
Surplus at October 31, 1936	$1964.95	
Profit 8 months ending June 30, 1937	$1188.51	
Surplus at June 30, 1937	$3153.46	
LIABILITIES AND NET WORTH		$3191.91

In examining the ledger the Committee was surprised to find no charges for the services that have been rendered by the office of Nickerson & Collins Company.

Next came the report of the Resolutions Committee, by Mr. Black, as follows:

We, the Resolutions Committee, suggest the following resolutions be adopted at this time:

WHEREAS: The Chicago Chapter and their various committees having entertained us most highly throughout the convention;

WHEREAS, the Ladies Committee of the Chicago Chapter devoted most liberally of their efforts in furnishing entertainment in a most gracious manner. We do not believe a single detail has been overlooked which could contribute more to their happiness, and

WHEREAS, the visiting ladies have helped to make the convention more enjoyable by their attendance, and

WHEREAS, the speakers who contributed of their time to entertain us; also the speakers who devoted their time and study to our common problems and presented technical help to solve them, especially Mr. Stedman of the Cramer-Krasselt Co., who gave us an entirely different line of thought for the promotion of our own welfare, and

WHEREAS, all the firms in Chicago who furnished so generously their time and funds to help the Chicago Chapter make the Convention a success, and

WHEREAS, the Hotel and its management, who has been so hospitable, and

WHEREAS, the Manufacturers and Jobbers who have made the exhibition such an interesting and educational affair;

Now, therefore be it resolved the National Society extends its sincere gratitude to everyone who has so gladly cooperated to make this convention the success it has been.

WHEREAS the National Officers and Committees who have performed the duties of their respective offices in a most competent manner, and

WHEREAS, we do not desire to overlook others who have contributed to our welfare.

Now therefore be it resolved that we extend to all these persons our sincere appreciation and signify it by a rising vote of thanks.

New Business

Mr. Drownes presented for the consideration of the assembly, a revised set of resolutions compiled by an independent group of Chicago's contractors, pertaining to refrigerator parts manufacturers and jobbers, which appeared in the columns of the October issue. After considerable discussion on the matter, a motion was made by Mr. Wright "that a Trade Relations Committee be appointed to take this matter under consideration and to work with both the jobbers and the manufacturers so that we can properly handle this matter." Motion was duly seconded and carried.

Invitations were received next for the convention in 1938, from Buffalo, Indianapolis, Milwaukee, Pittsburgh and Toronto. Since the matter was to be decided by the Board of Directors, these invitations were turned over to them for consideration. The next city will be either Pittsburgh or Buffalo.

REPORT OF NATIONAL REFRIGERATION SUPPLY JOBBERS CONVENTION

THE National Refrigeration Supply Jobbers' Association struck a new high water mark in its conventions at its Third Annual Meeting held at the Stevens Hotel, Chicago, November 1-2. Approximately two-thirds of its active member companies were represented in person by upwards of 100 delegates who devoted two full days and evenings to the affairs of the Association and the refrigeration jobbing trade, as well as to events and functions of the Refrigeration Supplies & Parts Manufacturers' Association and the Refrigeration Service Engineers' Society, both of which likewise held very successful meetings during the week.

The Jobbers meeting was preceded by an all day session of the Board of Directors on October 31, during which it completed its work for the past year and also approved plans for the future.

The convention convened promptly at 9:30 on Monday morning. A full day was devoted to speeches and general discussion of subjects and problems of immediate concern to every jobber in the industry.

President R. H. Spangler opened the program with a very constructive address which was followed by greetings from President J. D. Colyer of the Refrigeration Supplies and Parts Manufacturers' Association and greetings from the Refrigeration Service Engineers' Society by Herman Goldberg, general chairman of the R.S.E.S. Convention Committees. The forenoon session was closed with a forceful address on the "Value of Trade Associations" by B. W. Rouark, chairman of the National Council of Wholesaling Associations.

F. H. Langsenkamp, Jr., of Indianapolis, opened the afternoon session with an inspiring talk on the subject "What Should a Member Expect from His Trade Association?" He was followed by an equally interesting paper by H. W. Merkel of Cincinnati, on "What Does It Cost a Jobber to Do Business?", which was followed by a talk by R. M. McClure of Chicago, on the "Importance of Cost Finding." H. W. Small of St. Paul closed the program with an exceptionally thoughtful address on "Membership Qualifications—Are We Headed in the Right Direction?"

The evening was spent at a get-acquainted buffet supper which proved to be one of the most enjoyable functions of the convention.

The entire day on Tuesday was taken up with a business session and a joint banquet with the Manufacturers in the evening. The reports of the officers were approved and each was accorded a vote of thanks for the attention given to the affairs of the Association during the year.

A view of the joint banquet of the Refrigeration Supplies and Parts Manufacturers Association and the National Refrigeration Supply Jobbers Association. The affair took place on the evening of Nov. 2, at the Stevens Hotel.

Likewise, the reports of the chairmen of the standing committees were similarly received, Arnold Dessau of New York, reporting for the Manufacturers Relations Committee, and Irving Alter of Chicago, for both the Advertising and Finance Committees.

On the recommendation of the Resolutions Committee, headed by H. W. Merkel of Cincinnati, several important decisions were made, among which were: a vote to reincorporate the Association under the laws of Illinois; the adoption of a new set of By-Laws to replace the former Constitution and set of By-Laws; a new basis for membership dues on a graduated scale based on yearly gross sales of refrigeration, air-conditioning supplies, parts and equipment; also changes to clarify the qualifications for membership both in the Association and for representation of the various sections of the country on the Board of Directors.

The date and location of the 1938 convention was left for later consideration and decision by the new Board of Directors which is composed of:

Mr. H. W. Merkel, *President* The Merkel Bros. Co., Burbank & C. L. & N. Ry., Cincinnati, Ohio.

Mr. L. H. Gorton, *Vice-President,* Machine Tool & Supply Co., 215 E. Second St., Tulsa, Oklahoma.

Mr. H. W. Blythe, *Secretary-Treasurer,* H. W. Blythe Company, 2334 S. Michigan, Chicago, Illinois.

Mr. Irving Alter, Harry Alter Co., 1728 S. Michigan, Chicago, Illinois.

Mr. M. W. Applebee, Burstein-Applebee Co., 1012 McGee St., Kansas City, Missouri.

Mr. F. A. M. Dawson, Refrigeration Supplies Co., Ltd., London, Ontario.

Mr. H. A. Dessau, Melchior, Armstrong, Dessau Co., 1104 Bedford Ave., New York, New York.

Mr. C. A. Kabat, Paramount Electrical Supply Co., 43 Warren Street, New York, New York.

Mr. F. Langsenkamp, Jr., F. H. Langsenkamp Co., 229 E. South Street, Indinapolis, Ind.

Mr. D. C. Lingo, D. C. Lingo Co., 1414 Fannin St., Houston, Texas.

Mr. H. S. McCloud, Williams and Co., Inc., 901 Pennsylvania Ave., Pittsburgh, Pa.

Mr. C. F. Pratt, California Refrigerator Co., 1077 Mission St., San Francisco, Calif., and

Mr. R. H. Spangler, The Spangler Company, 3331 Market St., St. Louis, Missouri, who, as the immediate past president, continues as a member of the Board for the coming year.

The Association office continues at 111 West Washington Street under the management of Ortman, McClure, Hadden & Co., management engineers.

REPORT OF REFRIGERATION SUPPLIES AND PARTS MANUFACTURERS' CONVENTION

BETWEEN the splendid program presented at the Third Annual Meeting on November 2 of the Refrigeration Supplies and Parts Manufacturers' Association and the various functions held in connection with it, the 150 executives present from the 60 odd manufacturing companies represented, left Chicago with two decidedly favorable impressions. The success of the meeting seemed fully to justify the judgment of those responsible for the organization of the Association two years ago and to compensate all who have given their time and financial support to the up-building of the organization. They also left with the feeling that their Association is on a firm footing and prospects for future accomplishments with resulting benefits to all manufacturers are particularly bright.

Much was accomplished to cement the friendship between the Jobbers and the Service Engineers organizations which also held sessions during the same week.

Under the leadership of President J. D. Colyer who opened the meeting, a constructive program of addresses and discussions preceded the formal business session which closed the day's deliberations.

In the president's message, Mr. Colyer reviewed the work of the past and pointed out the leading opportunities for service and accomplishments during the next 12 months. President R. H. Spangler of the National Refrigeration Supply Jobbers' Association, extended greetings from his organization to the Manufacturers and introduced H. W. Small of the Manufacturers Relations Committee of his organization, who presented to the Manufacturers a number of problems which the jobber faces in his business.

The remarks of both Messrs. Spangler and Small were cordially received.

Joseph Gootch Jr., of Gootch & Company, New York, who spoke on the subject "How to Make Profits Out of Industry Cooperation," left a message that will long be remembered by all who heard him. In three talks by Messrs. Malcombe Henning, vice-president of the Penn Electric Switch Co., H. V. Higley, secretary-treasurer, Ansul Chemical Co., and R. W. Kritzer, president, Peerless of America, Inc., the program was completed. In their talks made on the subject "What a Member Should Expect from His Trade Association," these three speakers not only endorsed the present activities of the Association but also pointed out opportunities for additional services which might well be undertaken when feasible. In the business session, a revised set of By-Laws was

adopted materially simplifying the former articles of incorporation.

To more clearly set forth its attitude with reference to good-will contributions by manufacturers to every branch of the industry, the following set of recommended house policies was unanimously approved:

National Associations. The Association recommends to its member firms in their contacts with the mechanical refrigeration trade that they lend financial and moral support to the Refrigeration Service Engineers' Society by subscribing to and retaining an associate membership in this society, by attending their convention and by contributing to the cost thereof by means of the payment of associate membership dues and of the registration fee set for convention attendants.

Donations and Contributions. The Association recommends to its members that no financial support be given in response to solicitations for the following purposes:

1. To make up deficits incurred by chapters, the society or any local association in the entertainment of visiting delegations of members of the trade to their city or state, or in the entertainment features of their own conventions, meetings, or similar events.
2. To provide souvenirs or funds for the purchase of souvenirs for those attending any association functions.
3. To provide funds for the purchase of intoxicating liquor or provide "special entertainment" for those attending a convention, dinner, or outing.
4. For advertising space, with or without mention of the firm name, in programs, banquet menus, books, ready-reference guides, etc.
5. For advertising space in a regular or special edition of a local newspaper, run in connection with the opening of a new or enlarged place of business or an installation on which a manufacturers' product is used.
6. For exhibit space at other than the national convention.
7. For purchase of advertising space in, or other financial support of, year books, annuals or similar publications issued by a student organization of colleges or other training schools.
8. For support (purchase of a block of tickets) or other participation in prize drawings, lotteries and similar schemes for raising funds.
9. For subscriptions to funds raised or attempted to be raised by one or more individuals as a tribute to living or deceased members (or their relatives) of the trade.
10. For contributions to local civic projects, fairs, celebrations and similar undertakings, except in those communities in which a manufacturer member firm has an established factory, warehouse or branch office.

Election of directors and officers concluded the business session for the coming year. The 1937 Board is composed of:

Mr. J. D. Colyer, *President,* Wolverine Tube Co., 1411 Central Ave., Detroit, Mich.

Mr. J. S. Forbes, *Vice-President,* Kerotest Mfg. Company, 2525 Liberty Ave., Pittsburgh, Pa.

Mr. H. V. Higley, *Treasurer,* Ansul Chemical Co., Marinette, Wisconsin.

Mr. C. M. Brown, Tecumseh Products Co., Tecumseh, Michigan.

Mr. D. H. Daskal, Perfection Refrigeration Parts Co., 152nd & Vincennes Ave., Harvey, Ill.

Mr. Edw. Gammie, Victor Mfg. & Gasket Co., 5750 Roosevelt Road, Chicago, Ill.

Mr. R. H. Luscombe, Penn Electric Switch Co., Goshen, Indiana.

Mr. Wm. A. Leonard, The Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago, Ill.

Mr. M. R. Oberholzer, L. H. Gilmer Co., Tacony, Philadelphia, Pennsylvania.

Mr. F. B. Riley, American Injector Company, 1481 14th St., Detroit, Michigan.

Mr. Chas. W. Johnston, Virginia Smelting Co., West Norfolk, Va.

Mr. K. B. Thorndike, Detroit Lubricator Co., 820 S. Michigan Ave., Chicago, Ill.

Richard M. McClure of Ortman, McClure, Hadden & Co., continues as the Executive Secretary.

A joint Manufacturers-Jobbers banquet was held in the evening at which the Manufacturers provided the speaker, Frank Wyse of Milwaukee, who spoke on "Dividends from a Trade Show—How to Get Them," and a very interesting hour's entertainment, "Major Boles' Amateur Hour," which was patterned after the famous Major Bowes' weekly broadcast.

A complimentary luncheon to the Jobbers on Wednesday noon, November 3, concluded the functions.

A. Cameron
Sydney, Australia

I want to thank you for sending THE REFRIGERATION SERVICE ENGINEER to me direct over the past twelve months. I have found it a great help in many ways, and can assure you of my continued support of same, as the local rag has nothing on it for news.

WE WONDER

WHY Mr. E. L. Bengston, of Davenport, Iowa, was continually smiling during the Convention in Chicago!!!!

Ozone Producing Devices

This Article Describes the Benefits of Ozone and How Ozone Is Produced

by RAE R. POWELL*

THE extensive use of ozone throughout the various industries resulted in a series of inquiries regarding the operation, maintenance and function of ozone generators.

The following article is devoted almost entirely to the application of ozone in the cold storage field, the reason for this being that the description of the application in this particular industry covers a dual purpose.

First, there is a problem of mold control, and second, that of odor elimination, whereas, in air conditioning and ventilation, the problem is primarily one of odor elimination and the freshening of the air.

The equipment described, herein, is basically the same for any application and only slight modifications are used in the construction of the various machines to adapt them to either one application or another.

The description of the chemical action of ozone on various odoriferous substances would pertain equally well in any odor problem, and the reference to cold storage is cited only because this problem goes hand in hand with mold control in the cold storage industry.

Ozone is a form of oxygen and is usually made or formed from the oxygen in the air. Its formation is accomplished either by a chemical method or by electrolytic, the standard practice as applied to commercial ozone generators in the electric method.

Oxygen exists in the air as a two-atom molecule. Under the influence of an electrical charge, this molecule is broken up and separated into single atoms. Some of these atoms will have a positive charge and some will have a negative charge and immediately upon liberation, they again combine. As they recombine, three atoms instead of the original two are found in the formation and this particular form is called ozone.

It can be readily seen that this is an unnatural state and it is not surprising that this formation, or ozone molecule, exhibits considerable activity. In fact it is a very unstable molecule and under normal conditions, its life is only a matter of a few minutes. During this period, its chemical activity is so great that it will attack, or oxidize, a tremendous number of substances and compounds that would normally react very slowly, if at all, with atmospheric oxygen. When ozone breaks up the atoms recombine to form normal oxygen.

Construction Details

An ozone generator is a device constructed for the sole purpose of bringing about this rearrangement of the oxygen atom. It primarily consists of two electrodes separated by an air gap through which an electrical current is passed. The amount of ozone formed by this arrangement is dependent upon conditions of temperature, humidity, voltage and amperage. Due to the fact that air alone is subject to tremendous electrical variations by reason of its varying moisture content, it has been found advisable, by most manufacturers of ozone generators, to insert in the gap, between the electrodes, some material that has a high dielectric property. Naturally, the cheapest and most common of such materials is glass, so the first improvement over the primary set-up would be two electrodes that are separated by a glass or other dielectric material. See Fig. 1.

The shape of the assembly, whether plate, cylindrical, or tubular, is of no particular moment, insofar as operating efficiency is concerned. Most manufacturers of this equipment have found that a round or cylindrical dielectric, closed on one end, is the most advantageous, as this shape is conducive to increased mechanical strength and provides an easy method of forming one electrode on the inner surface of the cylinder. The inner electrode, or the one inside the cylinder, can be formed by plating, bronzing, or the application of any metallic substance to the surface, that will conduct the current.

Plating is, undoubtedly, the most satisfactory. When this is done, the net result is a cylinder that is similar in every detail to a Leyden jar. A conductor is now attached to the metallic inner surface; then around the outside surface of the glass the

*President, The Electroaire Corp., Chicago.

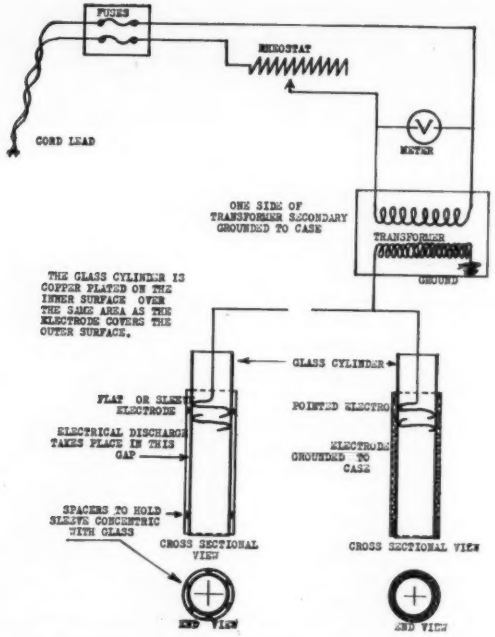

FUSES
RHEOSTAT
CORD LEAD
METER
ONE SIDE OF TRANSFORMER SECONDARY GROUNDED TO CASE
TRANSFORMER
GROUND
THE GLASS CYLINDER IS COPPER PLATED ON THE INNER SURFACE OVER THE SAME AREA AS THE ELECTRODE COVERS THE OUTER SURFACE.
GLASS CYLINDER
FLAT OR SLEEVE ELECTRODE
POINTED ELECTRO
ELECTRICAL DISCHARGE TAKES PLACE IN THIS GAP
ELECTRODE GROUNDED TO CASE
SPACERS TO HOLD SLEEVE CONCENTRIC WITH GLASS
CROSS SECTIONAL VIEW
CROSS SECTIONAL VIEW
END VIEW
END VIEW

FIG. 1. SCHEMATIC WIRING DIAGRAM OF OZONE GENERATOR.

other electrode is formed. It can either be a metallic sheet in the form of a sleeve, a perforated sheet, or a wire mesh. If a solid sheet is used, the outer electrode must be held away from the glass but concentric to it. If perforations or wire mesh are used, the points can be in direct contact with the glass. Fig. 2 shows one type of cylinder used with the outer electrode open, exposing to view the glass cylinder.

Now when electric current is applied to the electrode, a discharge would take place, either on the points of the perforations, around the edge of the mesh or between the sleeve and the glass. The only material difference resulting from this variation in con-

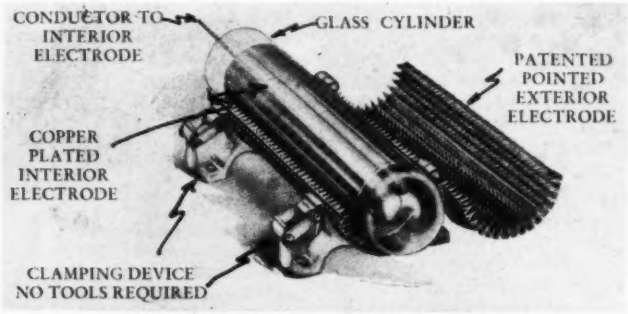


FIG. 2. CYLINDER ASSEMBLY.

struction would be that in the case of the sleeve, that is held away from the glass in order that a discharge can develop, it requires a somewhat higher electrical potential to jump the gap. Naturally, in order to form ozone, an air stream of low velocity must pass over the discharging surface or through the gap between the sleeve and glass cylinder. When perforated dielectrics or wire mesh are used, the small amount of heat generated by the electrical discharge is sufficient to cause a slow moving air current to pass over the generating unit, but when a sleeve type electrode is employed, blowers or fans must be used to force the air stream through the electrical discharge.

The size of the tubes most frequently used is from 2″ to 3″ in diameter and 12″ to 15″ or 16″ in length. The standard ozone generator is usually made up of one or more of these assemblies depending on the capacity of the machine required. Each manufacturer has carefully predetermined the amount of ozone generated by such an assembly, and experience has taught him the amount of ozone required for certain conditions. Knowing these two factors, it is an easy matter to determine how many generating units should be included in the given machine to take care of the given situation.

Operating Cost

The operating cost of this assembly is dependent upon certain factors of construction. The greatest factor is the function of the glass dielectrics. As the dielectric strength of this glass is increased it naturally requires greater current and great voltage to overcome its resistance. Careful study has to be made in selecting a dielectric to obtain one that has an optimum mechanical strength and at the same time of minimum thickness.

It is reasonable to expect that with an assembly of this sort higher voltages than normally found on light circuits must be employed. To accomplish this a transformer is used. This device will transform the ordinary power circuit or lighting circuit from its normal rating to a voltage of many thousand, and on the average commercial ozone generator, we find that the secondary voltage of the transformer is usually between 5,000 and 7,500.

The average unit assembly described, herein, would require less than 25 watts. Therefore, at the voltage used, it is obvious that the amperage required is exceedingly low. The initial operating cost per unit of 25 watts would probably also include the loss in the transformer, so that an assembly with two such generating units in it would probably require about 35 to 40 watts.

To substantiate this, we find that most of the large portable ozone generators on the market today, having from 10 to 15 such assemblies in them such as the model shown in Fig. 3, consume around 100 to 125 watts. This means that their actual cost of operation is no greater than an ordinary electric light bulb. Practice and experience has shown us that the cost of maintaining the average ozone generator is a negligible factor. Moisture and dirt accumulates on the glass dielectrics and interferes with the electrical discharge that is supposed to take place. The answer to this is that at intervals the glass dielectrics must be removed and cleaned. An examination of most of the equipment on the market shows that this is not a difficult task and probably requires not over one to two hours time per month.

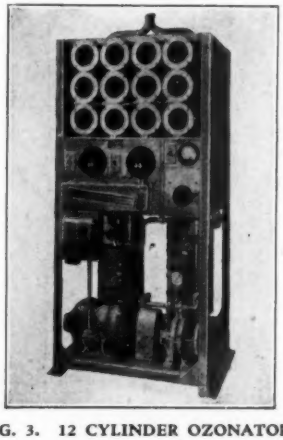


FIG. 3. 12 CYLINDER OZONATOR.

As labor and electricity comprise the total operating cost, we find that a fair average for electricity would be about two kilowatts per day, per twenty-four hour day, and two hours per month of labor. This does not make a high operating expense.

The purpose of ozone when used in cold storage is the elimination of odors and the reduction of mold growths. The construction of a warehouse is such that all conditions therein are conducive to the development of mold and the accumulation of odors, and unless extreme care, beyond the average operating practice, is observed, these conditions are certain to occur.

Ozone performs the same function that

fresh air and sunlight would if they were permitted to enter these storage rooms. Obviously, this is impractical, so the natural recourse is to bring into the room something which will perform the same function in the same manner.

The action of sunlight on the oxygen in the air is identical to the action obtained by the electrical discharge in the ozone generator. The ultra-violet rays from the sun, together with other solar emanations, have the property of increasing oxidation and freshening the air.

The elimination of odors will always fall into one of two classes. First, by dilution, or mixing with fresh air, and by direct oxidation. Oxidation is the method employed by nature. Therefore, the introduction of ozone into a cold storage room would produce results no different than natural methods.

Since ozone consists solely of oxygen, it can in no way introduce undesirable by-products—due to its reactions—that are foreign to pure air.

FIG. 4. SMALL COMMERCIAL OR HOUSEHOLD SIZE.

The exact nature of an odor is quite unknown, but it does not appear to be entirely in error to consider it as due to small particles of matter emanating from the parent substance,—an action somewhat similar to that of a radio-active compound. These small particles of matter possibly furnish the necessary food supply for the mold spores and at the same time the odor that is so destructive and contaminating to other produce.

When this condition is allowed to prevail, and no action taken to rectify it, a medley of undesirable effects result, such as pollution of flavors, etc. A further contingency is a tendency to decay, which always advances in a foul atmosphere saturated with foreign matter.

In the model cold storage plant, it is neither practical nor feasible, from an economic standpoint, to construct small rooms for the segregation of the different articles in each room. In a situation of this nature, it is practically impossible to eliminate contamination by any known means except ozone.

The application of ozone in very minute quantities soon renders the air sweet and free from the polluting elements. It is entirely practical to store a large variety of vegetables in the same room without fear of contamination when ozone is used as an additional medium of air conditioning. Onions, potatoes, cabbage, etc., can be kept together for a considerable period, with no unfavorable consequences, when the air is properly ozonized.

The action of ozone upon odors, and other organic compounds that permeate the air, is quite readily understood if one but considers that ozone is a chemical and a most powerful oxidizing agent. When liberated in an atmosphere saturated with organic compounds, the ozone immediately attacks the compounds and renders them harmless, and in one sense sterilizes the air as effectively as sunlight.

A natural sequence that follows this cleansing or sterilizing of the air by ozone is an almost complete disregard for the humidity in the cold room. As you eliminate the contaminating elements the presence of moisture will no longer be a potential source of pollution, but rather has a beneficial effect on the produce by materially eliminating shrinkage from evaporation, which is in itself the primary stage of decay.

Further studies have shown that, except in unusual conditions, the amount of oxidizable organic matter (odors, etc.) found in the air usually fall within rather close limits. The strength or disagreeableness of an odor is in no way a criterion of the amount of ozone or oxygen required for oxidation. It might, however, be an index to the rapidity of its rate of oxidation, but this is of no particular importance to the cold storage

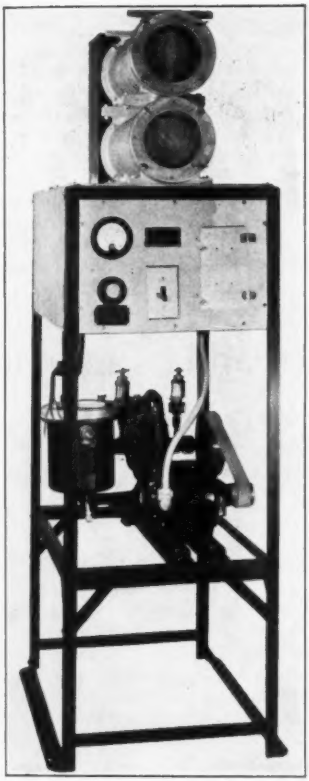


FIG. 5. 2 CYLINDER OZONATOR.

application. A better understanding of this might be obtained if we consider the odor arising from decaying meat or from a decayed vegetable. There would, undoubtedly, be some difference in the rate of decomposition, but the odors arising from the two different substances would be so different that the natural assumption is that much more ozone would be required to eliminate the odor of the meat than that of the vegetable.

Quite frequently, however, converse of this would be true, that the oxygen demand of the odors from decayed vegetation is greater than that of decaying meat. This, however, is not necessarily always true. Trial and experience has shown that under most circumstances, a concentration of .02 to .05 parts of ozone per million parts of air is sufficient to eliminate most warehouse odors, and when all is considered, this is not a large variation.

Furthermore, in order to compensate for varying conditions, an ozone generator must be equipped with a regulating device. This device is most usually a rheostat connected in the primary circuit of the transformer as shown in Fig. 1. Then as the primary voltage impressed on the transformer is varied, the secondary voltage varies, with the net result that the amount of ozone produced would correspondingly increase or decrease.

To many individuals, the odor of ozone is objectionable, particularly so when higher concentrations are used. However, this situation need not obtain because ozone is a chemical, its action is chemical and must be considered from a chemical standpoint. Therefore, the same as in any chemical reaction, the presence of any particular reagent would indicate an excess of that

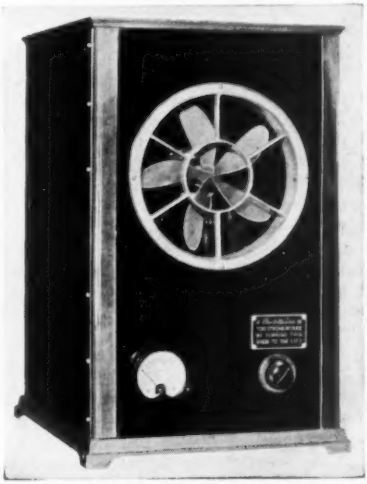


FIG. 6. ONE OF THE LARGER PORTABLE MODELS.

reagent and the same is true with ozone. In most cases, the odor of ozone begins to indicate that more than sufficient ozone is present to oxidize the organic matter present and in most cases a bare trace of the odor of ozone is ample. This simple fact forestalls the necessity of any complicated measuring or metering devices. However, for the control of mold, it is much better that somewhat larger amounts are used, or in cold rooms that are unfrequently occupied, it is usually desirable that the amount of ozone exist in an excess.

This is simply an insurance factor. The

action of ozone on most foodstuffs is entirely harmless and if an excess is allowed to exist, no harm would result.

The size of the ozone generator required in any instance to perform the proper function has usually been determined by the manufacturer. As previously stated they have determined the amount of ozone generated by a single unit under given conditions and then found the amount of ozone required on the average to eliminate the undesirable constituents of the air. Then, if they know the total cubic feet contained in a given room, it is very easy to find the number of generating units, or the size of the machine required for the purpose.

A size and model is made to fit nearly all purposes where ozone producing devices may be used. Figs. 3-4-5-6, though not covering all the different sizes, show a representative group of the styles and sizes in which these devices are produced.

In conclusion it is interesting to note that the United States Government reports show that 88 percent of all the cold storage houses use ozone for one purpose or another.

Velocities in Suction Mains and Evaporators

Third Article and Tables for Sulphur Dioxide

By J. O. SCHULTZ*

Sulphur dioxide as a refrigerant is used mostly in household refrigerating systems and in such units, in their restricted space, no oil separation is attempted, even though this gas has a great affinity for oil, this oil being carried through the evaporator system; therefore, to prevent blocked gas passages through oil clogging it has been recommended to use a velocity through the evaporator coils of 2000 ft. per minute, this at a sacrifice of an excessive drop in pressure.

The velocity of 2000 ft. per min. at the outlet of the coil is two and one-half times greater than should be used, and to partly compensate for the acknowledged excessive pressure drop that occurs in the evaporator coils, a further recommendation has been made to carefully lay out the suction main and, if necessary, to run two or more suction lines, manifolding same at the compressor inlet.

Low Temperature Refrigeration

For low temperature refrigeration this refrigerant is not as desirable as others, due to its operating pressure being below atmospheric pressure, and if stuffing boxes are used the danger of air infiltration is too great. The accompanying table has been prepared with the above in mind and, for serted between the suction temperatures of quick reference, a dotted line has been in- 13 and 14 degrees. This line represents the point at which the corresponding pressure is zero gauge. Temperatures of 13 degrees F. and below require the suction mains being under a vacuum.

Using the tables in these articles will make it easier for the estimator to provide the proper size and number of evaporator coils, and should prevent the errors, so often made in the past, of placing single coils on one feed, with the result that the compression unit is working at a much lower suction pressure than the refrigerator temperature requires, causing a much larger power consumption.

A drop in pressure of four-tenths of a pound in the suction or evaporator side of a sulphur dioxide refrigerating plant will increase the operating time about two and one-half per cent and the cost of power slightly higher than two and one-half per cent.

Viscosity of Vapor or Fluid

The viscosity of a vapor or fluid has an influence on the friction together with the size, length, and condition of the tubing or pipe. This factor is not known for many of the refrigerants and we can only use practical experience as a basis. This has been the guide used in each of the four tables presented in this article. See Table IV. Velocities in suction mains and evaporators —sulphur dioxide.

In the December issue the author of this article will discuss the size of suction mains for various refrigerants. More tables and specific examples will illustrate his article.

TABLE IV – Velocity in Suction Mains and Evaporators With Maximum Load Carrying Capacity of Coils

SO_2 Sulphur Dioxide—86° Condensing Temperature—Liquid Heat Content 42.12

Suction Temp °Fahr	Vapor Volume Cu. Ft. per Lb	Velocity in Suction Main, Ft. per Min	Heat Content of Liquid at Evap. Temp.	B.t.u. to Cool Liq. to Evaporating Temp.	Latent Heat of Vaporization	Per Cent Vaporized to Cool Liquid	Velocity at Coil Outlet, Ft. per Min.	Heat Content of Vapor	Vapor Heat Less Liquid Heat	Lbs. of Refrigerant Circulated per Min. per Ton Refrig.	Displacement Cu. In. per Min. per Ton Refrigeration	Maximum Load Carrying Capacity of Single Continuous Coil					
												½ In. Tube 0.12756 Sq. In. Area		⅝ In. Tube 0.2419 Sq. In. Area		¾ In. Tube 0.34837 Sq. In. Area	
												Tonnage	B.t.u. per Hour	Tonnage	B.t.u. per Hour	Tonnage	B.t.u. per Hour
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
0	7.280	4725	12.44	29.68	170.63	17.4	925	183.07	140.95	1.4189	17850	0.0793	958	0.1504	1805	0.2166	2599
1	7.099	4666	12.79	29.33	170.38	17.2	911	183.17	141.05	1.4179	17393	0.0803	962	0.1521	1825	0.2190	2628
2	6.923	4608	13.12	29.00	170.13	17.0	899	183.25	141.13	1.4171	16953	0.0812	974	0.1540	1848	0.2218	2661
3	6.751	4550	13.45	28.67	169.88	16.9	886	183.33	141.21	1.4163	16528	0.0821	985	0.1557	1868	0.2242	2690
4	6.584	4494	13.78	28.34	169.63	16.7	874	183.41	141.29	1.4155	16104	0.0831	997	0.1576	1891	0.2269	2723
5	6.421	4438	14.11	28.01	169.38	16.5	862	183.49	141.37	1.4147	15697	0.0841	1009	0.1595	1914	0.2297	2756
6	6.266	4384	14.45	27.67	169.12	16.4	850	183.57	141.45	1.4138	15308	0.0850	1020	0.1613	1934	0.2321	2785
7	6.114	4331	14.79	27.33	168.86	16.2	839	183.65	141.53	1.4131	14929	0.0860	1032	0.1631	1957	0.2349	2819
8	5.967	4279	15.13	26.99	168.60	16.0	827	183.73	141.61	1.4123	14562	0.0869	1043	0.1648	1978	0.2373	2848
9	5.822	4226	15.46	26.66	168.34	15.9	816	183.80	141.68	1.4116	14201	0.0880	1056	0.1669	2003	0.2403	2884
10	5.682	4175	15.80	26.32	168.07	15.7	805	183.87	141.75	1.4109	13853	0.0890	1068	0.1688	2026	0.2431	2917
11	5.548	4125	16.14	25.98	167.80	15.5	794	183.94	141.82	1.4102	13520	0.0899	1079	0.1705	2046	0.2455	2946
12	5.417	4076	16.48	25.64	167.53	15.3	783	184.01	141.89	1.4095	13194	0.0909	1090	0.1722	2066	0.2480	2976
13	5.289	4028	16.81	25.31	167.26	15.1	773	184.07	141.95	1.4089	12876	0.0919	1103	0.1743	2092	0.2510	3012
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	5.164	3979	17.15	24.97	166.97	15.0	763	184.14	142.01	1.4082	12566	0.0929	1115	0.1762	2114	0.2537	3044
15	5.042	3933	17.49	24.63	166.72	14.8	752	184.21	142.09	1.4075	12263	0.0939	1127	0.1781	2137	0.2564	3077

Continued on Next Page

TABLE IV – CONT. – Velocity in Suction Mains and Evaporators With Maximum Load Carrying Capacity of Coils

SO_2 Sulphur Dioxide—86° Condensing Temperature—Liquid Heat Content 42.12

16	4.926	3886	17.84	24.28	166.44	14.6	742	184.28	142.16	1.4069	11976	0.0948	1138	0.1798	2158	0.2589	3107
17	4.812	3843	18.18	23.94	166.16	14.4	733	184.34	142.22	1.4063	11694	0.0959	1151	0.1819	2183	0.2619	3143
18	4.701	3797	18.52	23.60	165.88	14.2	723	184.40	142.28	1.4057	11419	0.0969	1163	0.1838	2206	0.2646	3175
19	4.593	3753	18.86	23.26	165.60	14.0	713	184.46	142.34	1.4051	11152	0.0979	1175	0.1857	2228	0.2674	3209
20	4.487	3710	19.20	22.92	165.32	13.9	704	184.52	142.40	1.4045	10890	0.0990	1188	0.1877	2252	0.2704	3245
21	4.386	3668	19.55	22.57	165.03	13.7	695	184.58	142.46	1.4039	10640	0.1000	1200	0.1896	2275	0.2731	3277
22	4.287	3627	19.90	22.22	164.74	13.5	686	184.64	142.52	1.4033	10396	0.1010	1212	0.1915	2298	0.2758	3310
23	4.190	3585	20.24	21.88	164.45	13.3	677	184.69	142.57	1.4028	10157	0.1020	1224	0.1934	2321	0.2786	3343
24	4.096	3545	20.58	21.54	164.16	13.1	668	184.74	142.62	1.4023	9925	0.1030	1236	0.1953	2344	0.2813	3376
25	3.994	3501	20.92	21.20	163.87	12.9	659	184.79	142.67	1.4018	9675	0.1043	1252	0.1978	2374	0.2848	3418
26	3.915	3466	21.26	20.86	163.58	12.8	652	184.84	142.72	1.4013	9480	0.1053	1264	0.1997	2397	0.2876	3451
27	3.829	3428	21.61	20.51	163.28	12.6	643	184.89	142.77	1.4009	9269	0.1062	1274	0.2014	2417	0.2900	3480
28	3.744	3389	21.96	20.16	162.98	12.4	635	184.94	142.82	1.4004	9060	0.1073	1288	0.2035	2442	0.2930	3516
29	3.662	3352	22.30	19.82	162.68	12.2	627	184.98	142.86	1.4000	8859	0.1083	1300	0.2054	2465	0.2958	3550
30	3.581	3314	22.64	19.48	162.38	12.0	619	185.02	142.90	1.3996	8661	0.1094	1313	0.2075	2490	0.2988	3586
31	3.503	3279	22.98	19.14	162.08	11.8	611	185.06	142.94	1.3992	8470	0.1104	1325	0.2094	2513	0.3015	3618
32	3.437	3247	23.33	18.79	161.77	11.6	604	185.10	142.98	1.3988	8308	0.1113	1336	0.2111	2533	0.3040	3648
33	3.355	3209	23.68	18.44	161.46	11.4	596	185.14	143.02	1.3984	8108	0.1125	1350	0.2133	2560	0.3072	3686
34	3.283	3174	24.03	18.09	161.15	11.2	588	185.18	143.06	1.3980	7931	0.1135	1362	0.2152	2582	0.3100	3720
35	3.212	3139	24.38	17.74	160.84	11.0	581	185.22	143.10	1.3976	7757	0.1146	1375	0.2173	2608	0.3130	3756
36	3.144	3105	24.72	17.40	160.53	10.8	573	185.25	143.13	1.3973	7591	0.1155	1386	0.2190	2628	0.3154	3785
37	3.078	3072	25.07	17.05	160.21	10.6	566	185.28	143.16	1.3970	7430	0.1166	1399	0.2211	2653	0.3184	3821
38	3.013	3040	25.42	16.70	159.89	10.4	559	185.31	143.19	1.3967	7272	0.1177	1412	0.2232	2678	0.3214	3857
39	2.949	3007	25.77	16.35	159.57	10.2	552	185.34	143.22	1.3965	7116	0.1187	1424	0.2251	2701	0.3242	3890
40	2.887	2976	26.12	16.00	159.25	10.0	546	185.37	143.25	1.3961	6965	0.1200	1440	0.2276	2731	0.3277	3932
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

Servicing the McClellan Refrigeration Unit

Third Article—Continued from October

By L. K. WRIGHT, M.E.

Pumping Up an Air Pressure

To pump up the necessary pressure, first close the suction shut-off valve (1) and open the purge port (36) on same, so that air will be drawn into the system when the compressor is operated.

Make sure that the compressor head purge (10) is closed, discharge valve (8) open, head gauge valve (4) open, shut-off valve (22) on receiver open, the liquid shut-off valve (6) on receiver open, charging valve (7) closed and the valves before and after the jumper piece open. Purge (11) must be closed.

Then start motor by opening water valve and allow compressor to operate until the pressure has been built up to about 250 lbs. on the high pressure gauge. With a gloved hand, or protected with a cloth, remove the plug from the tee opening in the suction line previously occupied by valve (19). The plug will be blown out forcibly and care must be exercised not to be in its way, nor in the path of the escaping air, which will carry with it sand, grit, scale and dirt. If pieces of these solid particles strike the bare flesh they may do so with enough force to penetrate the skin. Therefore, use proper care to protect the person and especially the eyes from injury from any flying particles.

The system should be blown down several times in order to make sure that all scale and dirt has been blown out of the lines. When thought clear of dirt, the low pressure gauge valve can be reinstalled. The opening in the tee should be cleaned of oil, grease or graphite previously used on the plug and the valve should be set in place with litharge and glycerine. Both gauge valves (19 and 4) should be so adjusted that they read correctly with a minimum of needle vibration. Any safety valves in the system should be removed and the openings sealed with a plug, otherwise the valves may blow. Reinstall these safety valves or fusible plugs, depending upon regulations, after completing the test.

Pressure Testing

After the gauges have been installed and registering properly, close valve (19) and again pump up a 250 lb. pressure. When this pressure is reached close valve (36), through which the air is drawn for the test and stop the machine by closing the water inlet valve (17). This high pressure should be held on the system for 30 minutes to show that it is tight. Any large leaks, such as would result if the installers forgot to use a lead gasket in a flange or had not pulled the flange together evenly or tightly can be heard distinctly when the machine is stopped.

Joints should be tested with a thick solution of soap and water. Any small leaks will be immediately shown by the formation of soap bubbles. The thicker the soap solution the larger will be the bubbles before they break and of course they will be easier to detect. A thin solution is almost valueless.

If any leaks are located they should be marked and the remainder of the system tested for additional leaks. All the marked leaks should be repaired after pressure has been released from the system. Then the system should be pumped up to pressure again until it will hold a steady pressure of 250 lbs. for the time specified. This pressure will usually drop from five to ten lbs. when the machine is first stopped, due to some of the pressure entering and bringing the crankcase to proper pressure.

Never attempt to tighten up joints or make repairs on piping when the system is under a high pressure.

After the system has been proven tight, open valves (1), (36) and (11) to release the air pressure. Remove the scale trap and clean of all dirt and scale. Inspect gasket

and if damaged or too thin, replace with a new gasket and reinstall.

Originally, McClellan units were tested in the factory by operating them for a period of some hours under regular operating conditions. Such machines, when first installed and pressure tested, would give off an odor of ammonia, due to the release of part of the original charge used for testing in the factory.

In case of testing an old machine which has been moved to a new location this condition may be noticed. If the odor becomes very strong the release of pressure should be slowed down to allow time for the ammonia odor to be dispersed, or a purge hose can be connected to valve (11) and the gas discharged into a bucket of water, which will absorb the ammonia. The purge hose mentioned is a section of light hose, even of the drug-store type, about four feet long, with a ⅛ inch pipe nipple attached to one end.

Preparations for Charging Unit

While the pressure test is on the drum of anhydrous ammonia should be brought up and the charging hose connected. This charging hose is best made of a section of hydraulic compressor hose three or four feet long, each end of which has been fitted with ¼ inch extra heavy pipe nipples about a foot long, eight inches of which extend into the hose and are securely clamped by four hose clamps to prevent the ends from blowing out.

In making up such a hose, round off the end of the nipples to be pushed into the hose and then apply soap suds to the nipple end and also inside of the hose. Never use oil. The soap suds should be dried out by running a small piece of cloth through the tube and blowing air through it. If oil is used it will soften and destroy the rubber and may result in the hose being blown off the end of the nipple when pressure is applied. One of the hose nipples should be equipped with a ¼ inch companion flange to fit the charging flange (14). Flange (14) was generally a male, but this should be checked before making up the charging hose. These flanges were standard York products.

Where a hose is not available a piece of ¼ inch extra heavy steel pipe can be used. A piece about four or five feet long, such as may be left over on the job, may be used for the purpose.

There are several charging hoses available on the market today. These are special types, with woven wire reinforcing sheaths. Such hoses are certainly much safer than the ordinary type and if any amount of ammonia work is to be done, the extra cost involved in purchasing such equipment is warranted.

To Be Continued in the December Issue

Future articles will treat the subjects of—Charging Connections, Vacuum Tests, Removing Residual Air, Charging, Removing Ammonia Drum, Ammonia Charges, The Expansion Valve, etc.

Chapter 3

Heating and Air Conditioning

By H. D. BUSBY

FOR the purpose of simplifying the calculations of heat losses through materials and insulations commonly used in building construction, and through typical combinations found in building walls, a set of tables showing the coefficients of heat transfer for these materials or combinations has been compiled by the American Society of Heating and Ventilating Engineers. The first of these tables appears on the following pages, and will continue in succeeding issues. Starting with Table 2, they continue to and include Table 13.

Coefficients are expressed in B.t.u. per hour per square foot per degree Fahrenheit difference per one inch thickness, except in the tables for composite walls, in which the thickness of the wall is not considered.

Table 2. Conductivities (k) and Conductances (C) of Building Materials and Insulators[a]

The coefficients are expressed in Btu per hour per square foot per degree Fahrenheit per 1 in. thickness, unless otherwise indicated.

Material	Description					Density (Lb per Cu Ft)	Mean Temp. (D:o Fahr)	Conductivity (k) or Conductance (C)	Resistivity $\left(\frac{1}{k}\right)$ or Resistance $\left(\frac{1}{C}\right)$	Authority
	Cement	Fine Aggregate 0-No. 4	Coarse Aggregate No. 4-½	Slump	Per Cent Voids					
Sand and Gravel, Concrete	1	2.00	2.75	0	11.5	144.7	75.06	13.10	0.08	(4)
	1	2.75	4.50	0	10.9	145.7	74.77	12.90	0.08	(4)
	1	3.50	5.50	0	11.2	144.5	75.00	13.20	0.08	(4)
	1	2.00	2.75	5	13.9	142.5	75.50	12.10	0.08	(4)
	1	2.00	2.75	5	13.9	142.5	74.74	12.40	0.08	(4)
	1	2.75	4.50	5	14.6	141.1	73.30	12.40	0.08	(4)
	1	2.75	4.50	5	14.6	141.1	74.89	12.10	0.08	(4)
	1	3.50	5.50	5	14.7	139.2	74.50	12.85	0.08	(4)
	1	3.50	5.50	5	14.7	139.2	75.15	12.50	0.08	(4)
	Avg. Value for Sand and Gravel Concrete					142.3	.....	12.62	.....	---
Limestone Concrete	1	2.00	2.75	0	16.6	135.3	74.87	11.20	0.09	(4)
	1	2.75	4.50	0	15.4	137.8	75.18	12.00	0.08	(4)
	1	3.50	5.50	0	16.3	136.4	74.75	11.50	0.09	(4)
	1	2.00	2.75	3	20.9	130.1	74.85	10.50	0.10	(4)
	1	2.75	4.50	3	23.4	126.0	74.45	10.00	0.10	(4)
	1	3.50	5.50	3	23.4	127.3	75.26	9.79	0.10	(4)
	Avg. Value for Limestone Concrete					132.15	.....	10.83	.....	---
Cinder Concrete	1	2.00	2.75	0	18.2	103.6	75.26	4.63	0.22	(4)
	1	2.75	4.50	0	19.9	98.7	75.71	4.30	0.23	(4)
	1	3.50	5.50	0	21.4	92.0	75.72	3.73	0.27	(4)
	1	2.00	2.75	3	22.8	101.4	74.95	4.89	0.20	(4)
	1	2.75	4.50	3	26.0	94.0	75.20	4.38	0.23	(4)
	1	3.50	5.50	3	24.4	94.4	75.55	4.24	0.24	(4)
	Avg. Value for Cinder Concrete					97.35	.....	4.86	.....	---
Haydite	1	2.00	2.75	0	18.0	80.7	74.82	4.15	0.25	(4)
	1	2.75	4.50	0	19.8	75.0	75.75	3.78	0.26	(4)
	1	3.50	5.50	0	21.8	71.7	74.82	3.67	0.27	(4)
	1	2.00	2.75	4	21.2	78.8	74.76	4.38	0.23	(4)
	1	2.75	4.50	4	22.2	72.4	75.39	3.89	0.26	(4)
	1	2.75	4.50	4	22.2	72.4	75.49	3.86	0.26	(4)
	1	3.50	5.50	4	23.9	71.0	75.46	4.00	0.25	(4)
	Avg. Value for Haydite					74.57	.....	3.96	.....	---

Authorities:

[1]U. S. Bureau of Standards, tests based on samples submitted by manufacturers.

[2]A. C. Willard, L. C. Lichty, and L. A. Harding, tests conducted at the University of Illinois.

[3]J. C. Peebles, tests conducted at Armour Institute of Technology, based on samples submitted by manufacturers.

[4]F. B. Rowley, tests conducted at the University of Minnesota.

[5]A.S.H.V.E. Research Laboratory.

[6]E. A. Allcut, tests conducted at the University of Toronto.

[7]Lees and Charlton.

*Recommended conductivities and conductances for computing heat transmission coefficients.

†For thickness stated or used on construction, not per 1-in. thickness.

[a]For additional conductivity data see Chapters 3 and 15, 1937 *A.S.R.E. Data Book*.

[b]If outside surface of block is painted with an impervious coat of paint, add 0.07 to resistance for sand and gravel blocks. Add 0.18 to resistance for cinder blocks. Add 0.17 to resistance for haydite blocks.

[c]Recommended value. See Heating, Ventilating and Air Conditioning, by Harding and Willard, revised edition, 1932.

[d]See A.S.H.V.E. Research Paper, Conductivity of Concrete, by F. C. Houghten and Carl Gutberlet (A.S.H.V.E. Transactions, Vol. 38, 1932).

[e]The 6-in., 8-in., and 10-in. hollow tile figures are based on two cells in the direction of heat flow. The 12-in. hollow tile is based on three cells in the direction of heat flow. The 16-in. hollow tile consists of one 10-in. and one 6-in. tile, each having two cells in the direction of heat flow.

[f]Not compressed.

[g]Roofing, 0.15-in. thick (1.34 lb per sq ft), covered with gravel (0.83 lb per sq ft), combined thickness assumed 0.25.

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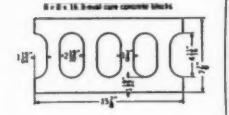
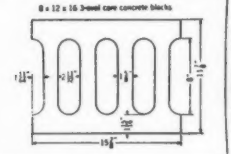
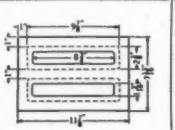
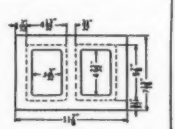
Table 2. Conductivities (k) and Conductances (C) of Building Materials and Insulators—Continued

The coefficients are expressed in Btu per hour per square foot per degree Fahrenheit per 1 in. thickness unless otherwise indicated.

Material	Description: Cement	Fine Aggregate 0-No. 4	Coarse Aggregate No. 4-1½	Slump	Per Cent Voids	Density (Lb per Cu Ft)	Mean Temp. (D.eg Fahr)	Conductivity (k) or Conductance (C)	Resistivity $\left(\frac{1}{k}\right)$ or Resistance $\left(\frac{1}{C}\right)$	Authority
Expanded Burned Clay	1	8.00			18.4	57.9	75.57	2.28	0.44	(4)
Steam Treated Limestone Slag	1	7.00			27.1	74.6	74.49	2.27	0.44	(4)
Pumice Mined in Calif.	1	8.00			26.5	65.0	74.68	2.42	0.41	(4)
By-Product of Manufacture of Phosphates	1	8.00	Fineness Modulus 3.75		25.5	86.6	74.62	3.19	0.31	(4)
	1	8.00			21.1	91.1	74.43	3.42	0.29	(4)
Haydite	1	8.50			21.8	67.1	75.89	2.89	0.35	(4)
	1	8.50			21.8	67.1	74.60	2.815	0.34	(4)
	Sand and gravel aggregate					126.4	40	0.900†	1.11	(4)
	Sand and gravel aggregate used for calculations					.....	.....	1.000†*	1.00	(4)
	Cores filled with 5.14 lb density cork					.....	40	0.560†*	1.79	(4)
	Crushed limestone aggregate					134.3	40	0.856†*	1.17	(4)
	Cinder aggregate					86.2	40	0.577†	1.73	(4)
	Cinder aggregate used for calculations					.....	.....	0.600†*	1.66	(4)
	Cores filled with 69.7 lb density cinders					.....	40	0.390†	2.56	(4)
	Cores filled with 5.12 lb density cork					.....	40	0.250†*	4.00	(4)
	Cores filled with 14.2 lb density rock wool					.....	40	0.266†*	3.76	(4)
	Haydite aggregate					67.7	40	0.495†*	2.02	(4)
	Cores filled with 5.06 lb density cork					.....	40	0.206†	4.85	(4)
	Sand and gravel aggregate					124.9	40	0.777†	1.29	(4
	Sand and gravel aggregate used for calculations					.....	.....	0.800†*	.....	(4)
	Cinder aggregate					86.2	40	0.531†*	1.88	(4)
	Cores filled with 5.24 lb density cork					.....	40	0.237†*	4.22	(4)
	Haydite aggregate					76.7	40	0.468†	2.13	(4)
	Cores filled with 5.6 lb density cork					.....	40	0.168†*	5.94	(4)
	Cinder aggregate					100.0	40	1.00††	1.00	(4)
	Double wall with 1 in. air space between					100.0	40	0.358†	2.70	(4)
	1 in. space filled with 9.97 lb density rock wool					100.0	40	0.204†	4.90	(4)
	5 x 8 x 12 block sand and gravel aggregate					133.7	40	0.380†	2.63	(4)
	5 x 8 x 12 block sand and gravel aggregate[b]					134.0	40	0.947†	1.06	(4)

For notes, see first page of Table 2.

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TABLE 2. CONDUCTIVITIES (k) AND CONDUCTANCES (C) OF BUILDING MATERIALS AND INSULATORS—Continued

The coefficients are expressed in Btu per hour per square foot per degree Fahrenheit per 1 in. thickness, unless otherwise indicated.

Material	Description	Density (Lb per Cu Ft)	Mean Temp. (Deg Fahr)	Conductivity (k) or Conductance (C)	Resistivity $\left(\frac{1}{k}\right)$ or Resistance $\left(\frac{1}{C}\right)$	Authority
MASONRY MATERIALS						
Brick	Low density	.....	.....	5.00*	0.20	....
	High density	.....	.....	9.20*	0.11	....
Brickwork	Damp or wet	.....	.....	5.00*	0.20	(2)
Cement Mortar	Typical	.....	.....	12.00*	0.08	....
Concrete	Various ages and mixes[d]	.....	.....	11.35 *to* 16.36	.....	.... (5)
	Cellular	40.0	75	1.06	0.94	(3)
	Cellular	50.0	75	1.44	0.69	(3)
	Cellular	60.0	75	1.80	0.56	(3)
	Cellular	70.0	75	2.18	0.46	(3)
	Typical fiber gypsum, 87.5% gypsum and 12.5% wood chips	51.2	74	1.66*	0.60	(4)
	Special concrete made with an aggregate of hardened clay—1-2-3 mix	101.0	70	3.98	0.25	(3)
Stone	Typical	.....	.....	12.50*	0.08	....
Stucco	Typical	.....	.....	12.00*	0.08	....
Tile	Typical hollow clay (4 in.)	.....	.....	1.00†*	1.00	....
	Typical hollow clay (6 in.)[e]	.....	.....	0.64†*	1.57	....
	Typical hollow clay (8 in.)[e]	.....	.....	0.60†*	1.67	....
	Typical hollow clay (10 in.)[e]	.....	.....	0.58†*	1.72	....
	Typical hollow clay (12 in.)[e]	.....	.....	0.40†*	2.50	....
	Typical hollow clay (16 in.)[e]	.....	.....	0.31†*	3.23	....
	Hollow clay (2 in.) $\frac{1}{2}$-in. plaster both sides	120.0	110	1.00†	1.00	(2)
	Hollow clay (4 in.) $\frac{1}{2}$-in. plaster both sides	127.0	100	0.60†	1.67	(2)
	Hollow clay (6 in.) $\frac{1}{2}$-in. plaster both sides	124.3	105	0.47†	2.13	(2)
	Hollow gypsum (4 in.)	.....	.....	0.46†*	2.18	....
	Solid gypsum	51.8	70	1.66	0.60	(4)
	Solid gypsum	75.6	76	2.96	0.34	(4)
Tile or Terrazzo	Typical flooring	.....	.....	12.00*	0.08	....
INSULATION—BLANKET OR FLEXIBLE TYPES						
Fiber	Typical	.....	...	0.27*	3.70	...
	Chemically treated wood fibers held between layers of strong paper[f]	3.62	70	0.25	4.00	(3)
	Eel grass between strong paper[f]	4.60	90	0.26	3.85	(1)
	" " " " "	3.40	90	0.25	4.00	(1)
	Flax fibers between strong paper[f]	4.90	90	0.28	3.57	(1)
	Chemically treated hog hair between kraft paper[f]	5.76	71	0.26	3.85	(3)
	Chemically treated hog hair between kraft paper and asbestos paper[f]	7.70	71	0.28	3.57	(3)
	Hair felt between layers of paper[f]	11.00	75	0.25	4.00	(3)
	Kapok between burlap or paper[f]	1.00	90	0.24	4.17	(1)
	Jute fiber[f]	6.70	75	0.25	4.00	(3)
	Ground paper between two layers, each $\frac{3}{8}$-in. thick made up of two layers of kraft paper (sample $\frac{3}{4}$-in. thick)	12.1	75	0.40†	2.50	(4)
INSULATION—SEMI-RIGID TYPE						
Fiber	Felted cattle hair[f]	13.00	90	0.26	3.84	(1)
	" " "	11.00	90	0.26	3.84	(1)
	Flax[f]	12.10	70	0.30	3.33	(3)
	Flax and rye[f]	13.60	90	0.32	3.12	(1)
	Felted hair and asbestos[f]	7.80	90	0.28	3.57	(1)
	75% hair and 25% jute[f]	6.30	90	0.27	3.70	(1)
	50% hair and 50% jute[f]	6.10	90	0.26	3.85	(1)
	Jute[f]	6.70	75	0.25	4.00	(3)
	Felted jute and asbestos[f]	10.00	90	0.37	2.70	(1)
	Compressed peat moss	11.00	70	0.26	3.84	(3)
INSULATION—LOOSE FILL OR BAT TYPE						
Fiber	Made from ceiba fibers[f]	1.90	75	0.23	4.35	(3)
	" " " "	1.60	75	0.24	4.17	(3)

For notes, see first page of Table 2.

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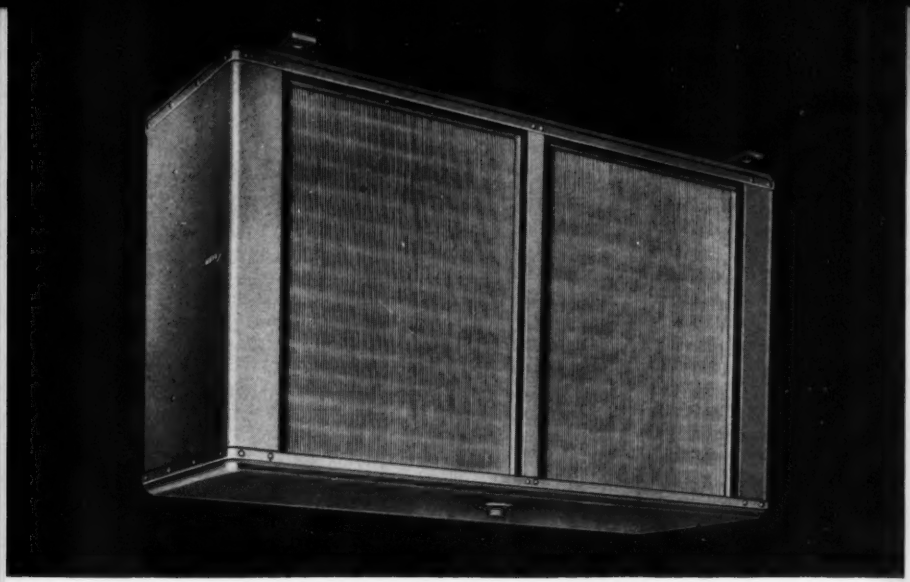
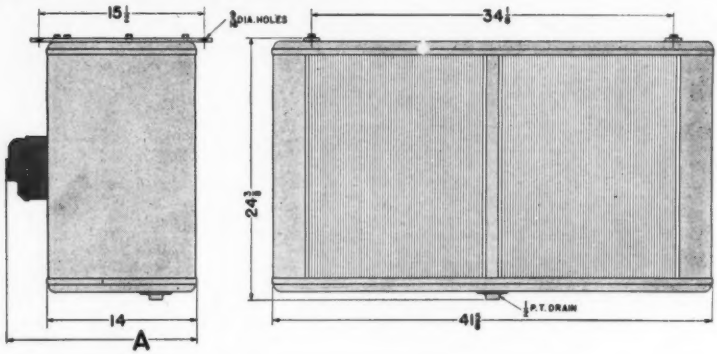


Showing attractive cabinet design and minimum height of Fedders Twin-73 Unit Coolers. Adjustable louvers can be furnished as extra equipment when specified.



UNIT COOLER MODEL NO.	A
2162	14 15/16
2164	17¾

Dimensions show compact size and minimum headroom occupied by Fedders Twin 73 Unit Coolers.

Rear View showing two rubber mounted motors, fans and Fedders Thermostatic Expansion Valve.

FEDDERS

Announces New

Twin-73

UNIT COOLERS

Fedders Twin-73 Unit Coolers provide large cooling capacity with compact size. Being of horizontal side by side design they occupy minimum headroom—no more in fact than occupied by single unit coolers of half the capacity.

They are designed for installation in large walk-in refrigerators and storage rooms as well as for use in comfort cooling in stores, offices, work-rooms, restaurants and other similar locations.

CANNOT RUST

Attractively designed cabinets are made of permanently rustproof metal. All parts, including bolts, nuts, washers and hanger brackets are rustproof. Conveniently located hanger brackets are furnished on the top of the unit and provide easy installation. Cabinet is insulated at bottom to prevent accumulation of condensate on outside.

ALL COPPER COOLING ELEMENT

The single cooling element is made of 5/8" OD seamless copper tubing with flat copper fins. The fins are arranged vertically, providing quick drainage of condensate. Model 2162 has two parallel banks of tubing and Model 2164 has four parallel banks. Inlet and outlet of all banks are manifolded in parallel.

THERMOSTATIC EXPANSION VALVE

Fedders Thermostatic Expansion Valve is standard equipment providing accurate refrigerant control, and permitting the unit cooler to be connected in multiple with other lowside equipment operating from a single condensing unit.

MOTORS

Fully enclosed moisture-proof motors are mounted in rubber for quiet operation. Bottom of cabinet is equipped with 1/2" pipe tap drain connection for carrying off condensate.

Write for Bulletin 304

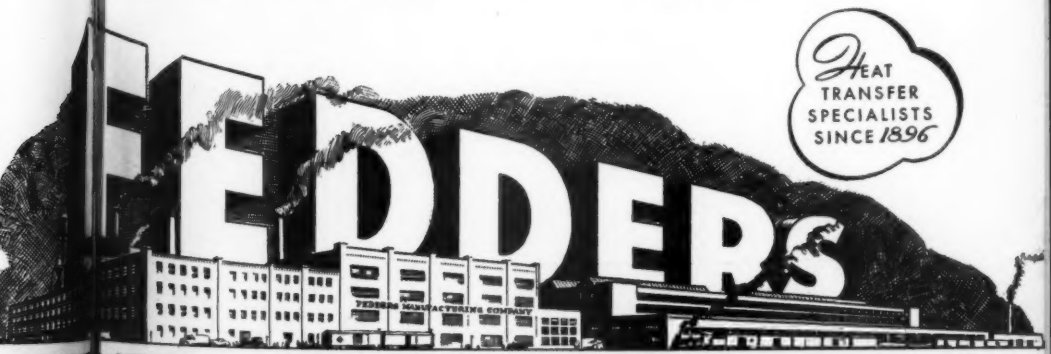


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TABLE 2. CONDUCTIVITIES (k) AND CONDUCTANCES (C) OF BUILDING MATERIALS AND INSULATORS—Continued

The coefficients are expressed in Btu per hour per square foot per degree Fahrenheit per 1 in. thickness, unless otherwise indicated.

Material	Description	Density (Lb per Cu Ft)	Mean Temp. (Deg Fahr)	Conductivity (k) or Conductance (C)	Resistivity $\left(\frac{1}{k}\right)$ or Resistance $\left(\frac{1}{C}\right)$	Authority
INSULATION—LOOSE FILL OR BAT TYPE —Continued						
Fiber	Fibrous material made from dolomite and silica	1.50	75	0.27	3.70	(3)
	Fibrous material made from slag	9.40	103	0.27	3.70	(1)
Glass Wool	Fibrous material 25 to 30 microns in diameter, made from virgin bottle glass	1.50	75	0.27	3.70	(3)
Granular	Made from combined silicate of lime and alumina	4.20	72	0.24	4.17	(3)
	Made from expanded aluminum-magnesium silicate	6.20	42	0.32	3.12	(3)
Gypsum	Cellular, dry	30.00	90	1.00	1.00	(1)
	" "	24.00	90	0.77	1.30	(1)
	" "	18.00	90	0.59	1.69	(1)
	" "	12.00	90	0.44	2.27	(1)
	Flaked, dry and fluffy[f]	34.00	90	0.60	1.67	(1)
	" " " "	26.00	90	0.52	1.92	(1)
	" " " "	24.00	75	0.48*	2.08	(3)
	" " " "	19.80	90	0.35	2.86	(1)
	" " " "	18.00	75	0.34	2.94	(3)
Mineral Wool	All forms, typical	.....	....	0.27*	3.70	....
Regranulated Cork	About ¼-in. particles	8.10	90	0.31	3.22	(1)
Rock Wool	Fibrous material made from rock	21.00	90	0.30	3.33	(1)
	" " " " "	18.00	90	0.29	3.45	(1)
	" " " " "	14.00	90	0.28	3.57	(1)
	" " " " "	10.00	90	0.27*	3.70	(1)
	Rock wool with a binding agent	14.50	77	0.33	3.03	(1)
	Rock wool with flax, straw pulp, and binder	14.50	75	0.38	2.63	(3)
	Rock wool with vegetable fibers	11.50	72	0.31	3.22	(3)
Sawdust	Various	12.00	90	0.41	2.44	(1)
Shavings	Various from planer	8.80	90	0.41	2.44	(1)
	From maple, beech and birch (coarse)	13.20	90	0.36	2.78	(1)
	Redwood bark	3.00	90	0.31	3.22	(1)
INSULATION—RIGID						
Corkboard	Typical	.....	....	0.30*	3.33	....
	No added binder	14.00	90	0.34	2.94	(1)
	" " "	10.60	90	0.30	3.33	(1)
	" " "	7.00	90	0.27	3.70	(1)
	" " "	5.40	90	0.25	4.00	(1)
	Asphaltic binder	14.50	90	0.32	3.12	(1)
Fiber	Typical	.....	....	0.33*	3.03	....
	Chemically treated hog hair covered with film of asphalt	10.00	75	0.28	3.57	(3)
	Made from corn stalks	15.00	71	0.33	3.03	(3)
	" " exploded wood fibers	17.90	78	0.36	3.12	(4)
	" " hard wood fibers	15.20	70	0.32	3.12	(3)
	Insulating plaster 9/10-in. thick applied to ⅜-in. plaster board base	54.00	75	1.07†	0.93	(3)
	Made from licorice roots	16.10	81	0.34	2.94	(3)
	Made from 85% magnesia and 15% asbestos	19.30	86	0.51	1.96	(1)
	Made from shredded wood and cement	24.20	72	0.46	2.17	(3)
	" " sugar cane fiber	13.50	70	0.33	3.03	(3)
	Sugar cane fiber insulation blocks encased in asphalt membrane	13.80	70	0.30	3.33	(3)
	Made from wheat straw	17.00	68	0.33	3.03	(3)
	" " wood fiber	15.90	72	0.33	3.03	(3)
	" " " "	15.00	70	0.33	3.03	(3)
	" " " "	.....	52	0.33	3.03	(6)
	" " " "	8.50	72	0.29	3.45	(3)
	" " " "	15.20	....	0.33	3.03	(3)
	" " " "	16.90	90	0.34	2.94	(1)
BUILDING BOARDS						
Asbestos	Compressed cement and asbestos sheets	123.00	86	2.70	0.37	(1)
	Corrugated asbestos board	20.40	110	0.48	2.08	(2)

For notes, see first page of Table 2.

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Table 2. Conductivities (k) and Conductances (C) of Building Materials and Insulators—Continued

The coefficients are expressed in Btu per hour per square foot per degree Fahrenheit per 1 in. thickness, unless otherwise indicated.

Material	Description	Density (Lb per Cu Ft)	Mean Temp. (Deg Fahr)	Conductivity (k) or Conductance (C)	Resistivity $\left(\frac{1}{k}\right)$ or Resistance $\left(\frac{1}{C}\right)$	Authority
BUILDING BOARDS —Continued						
Asbestos	Pressed asbestos mill board	60.50	86	0.84	1.19	(1)
	Sheet asbestos	48.30	110	0.29	3.45	(2)
Gypsum	Gypsum between layers of heavy paper	62.80	70	1.41	0.71	(3)
	Rigid, gypsum between layers of heavy paper (½-in. thick)	53.50	90	2.60†	0.38	(1)
	Gypsum mixed with sawdust between layers of heavy paper (0.39-in. thick)	60.70	90	3.60†	0.28	(1)
Plaster Board	(⅜ in.)	.....	...	3.73†*	0.27	—
	(½ in.)	.....	...	2.82†*	0.35	—
ROOFING CONSTRUCTION						
Roofing	Asphalt, composition or prepared	70.00	75	6.50†*	0.15	(3)
	Built up—⅜-in. thick	.....	...	3.53†*	0.28	—
	Built up, bitumen and felt, gravel or slag surfaced[g]	.....	...	1.33	0.75	(2)
	Plaster board, gypsum fiber concrete and 3-ply roof covering 2½ in. thick	52.40	76	0.58†	1.72	(4)
Shingles	Asbestos	65.00	75	6.00†*	0.17	(3)
	Asphalt	70.00	75	6.50†*	0.15	(3)
	Slate	201.00	...	10.37*	0.10	(7)
	Wood	.....	...	1.28†*	0.78	—
PLASTERING MATERIALS						
Plaster	Cement	.....	...	8.00	0.13	(2)
	Gypsum, typical	.....	...	3.30*	0.30	—
	Thickness ⅝ in.	.....	73	8.80†	0.11	(4)
Metal Lath and Plaster	Total thickness ¾ in.	.....	...	4.40†*	0.23	—
Wood Lath and Plaster	⅜-in. plaster, total thickness ¾ in.	.....	70	2.50†*	0.40	(4)
BUILDING CONSTRUCTIONS						
Frame	1-in. fir sheathing and building paper	.....	30	0.71†*	1.41	(4)
	1-in. fir sheathing, building paper, and yellow pine lap siding	.....	20	0.50†*	2.00	(4)
	1-in. fir sheathing, building paper and stucco	.....	20	0.55	1.82	(4)
	Pine lap siding and building paper—siding 4 in. wide	.....	16	0.85†*	1.18	(4)
	Yellow pine lap siding	.....	...	1.28†*	0.78	—
Flooring	Maple—across grain	40.00	75	1.20	0.83	(3)
	Battleship linoleum (¼-in.)	.....	...	1.36†*	0.74	—
AIR SPACE AND SURFACE COEFFICIENTS						
Air Spaces	Over ¾-in. faced with ordinary building materials	.....	40	1.10†*	0.91	(4)
Surfaces, Ordinary	Still air (f_i)	.....	...	1.65†*	0.61	(4)
	15 mph—(f_o)	.....	...	6.00†*	0.17	(4)
Surface, Rough Stucco	15 mph—(f_o)	.....	...	9.00†*	0.11	(4)
Surface, Bright Aluminum	Still air (f_i)	.....	60	1.18†	0.85	—
AIR SPACES FACED WITH BRIGHT ALUMINUM FOIL						
	Air space, faced one side with bright aluminum foil, over ¾-in. wide	.....	50	0.46†*	2.17	(4)
	Air space, faced one side with bright aluminum foil, ⅜-in. wide	.....	50	0.62†	1.61	(4)
	Air space, faced both sides with bright aluminum foil, over ¾-in. wide	.....	50	0.41†*	2.44	(4)
	Air space, faced both sides with bright aluminum foil, ⅜-in. wide	.....	50	0.57†	1.75	(4)

For notes, see first page of Table 2.

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TABLE 2. CONDUCTIVITIES (k) AND CONDUCTANCES (C) OF BUILDING MATERIALS AND INSULATORS—Continued

The coefficients are expressed in Btu per hour per square foot per degree Fahrenheit per 1 in. thickness, unless otherwise indicated.

Material	Description	Density (Lb per Cu Ft)	Mean Temp. (Deg Fahr)	Conductivity (k) or Conductance (C)	Resistivity ($\frac{1}{k}$) or Resistance ($\frac{1}{C}$)	Authority
AIR SPACES FACED WITH BRIGHT ALUMINUM FOIL—Continued						
	Air space divided in two with single curtain of bright aluminum foil (both sides bright)					
	Each space over ¾-in. wide	.....	50	0.23†*	4.35	(4)
	Each space ¾-in. wide	.....	50	0.31†	3.23	(4)
	Air space with multiple curtains of bright aluminum foil, bright on both sides, curtains more than ¾-in. apart, air circulation between spaces prevented:					
	2 curtains, forming 3 spaces	.....	50	0.15†*	6.78	(4)
	3 curtains, forming 4 spaces	.....	50	0.11†*	9.22	(4)
	4 curtains, forming 5 spaces	.....	50	0.09†*	11.06	(4)
SPACES FACED WITH NON-METALLIC REFLECTIVE SURFACE						
	Fabric with non-metallic reflective surface (1/16 in. thick) placed in center of a 1½ in. air space	.....	70	0.33†	3.03	(3)
	Core of fiber board coated two sides with non-metallic reflective surface (3/16 in. thick) placed in space having approximately ¾ in. air space on each side	23.4	70	0.27†	3.70	(3)
	Fiber board coated one side with non-metallic reflective surface (3/16 in. thick) placed in space having approximately ¾ in. air space on each side	.....	75	0.49†	2.04	(3)
	Air space divided in two with fabric faced both sides with non-metallic reflective surface, each space over ¾-in. wide	.....	40	0.33†	3.03	(4)
	Air space over ¾-in. wide faced one side with non-metallic reflective surface	.....	40	0.67†	1.49	(4
WOODS (Across Grain)						
Balsa		20.0	90	0.58	1.72	(1)
		8.8	90	0.38	2.63	(1)
		7.3	90	0.33	3.03	(1)
California Redwood	0% moisture	22.0	75	0.66	1.53	(4)
	0% "	28.0	75	0.70	1.43	(4)
	8% "	22.0	75	0.70	1.43	(4)
	8% "	28.0	75	0.75	1.33	(4)
	16% "	22.0	75	0.74	1.35	(4)
	16% "	28.0	75	0.80	1.25	(4)
Cypress		28.7	86	0.67	1.49	(1)
Douglas Fir	0% moisture	26.0	75	0.61	1.64	(4)
	0% "	34.0	75	0.67	1.49	(4)
	8% "	26.0	75	0.66	1.52	(4)
	8% "	34.0	75	0.73	1.33	(4)
	16% "	26.0	75	0.76	1.32	(4)
	16% "	34.0	75	0.82	1.22	(4)
Eastern Hemlock	0% moisture	22.0	75	0.60	1.67	(4)
	0% "	30.0	75	0.76	1.32	(4)
	8% "	22.0	75	0.63	1.59	(4)
	8% "	30.0	75	0.81	1.23	(4)
	16% "	22.0	75	0.67	1.49	(4)
	16% "	30.0	75	0.85	1.18	(4)
Hard Maple	0% moisture	40.0	75	1.01	0.99	(4)
	0% "	46.0	75	1.05	0.95	(4)
	8% "	40.0	75	1.08	0.93	(4)
	8% "	46.0	75	1.13	0.89	(4)
	16% "	40.0	75	1.15	0.87	(4)
	16% "	46.0	75	1.21	0.83	(4)

For notes, see first page of Table 2.

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REFRIGERATION SERVICE ENGINEERS' SOCIETY

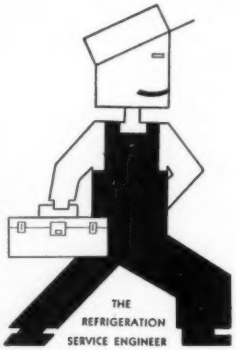
Official Announcements of the activities of the National Society and Local Chapters appear in this department as well as articles pertaining to the educational work of the Society.

THE OBJECTS OF THE SOCIETY

To further the education and elevation of its members in the art and science of refrigeration engineering; for the reading and discussion of appropriate papers and lectures; the preparation and distribution among the membership of useful and practical information concerning the design, construction, operation and servicing of refrigerating machinery.

ASSOCIATION HEADQUARTERS: 433-435 North Waller Ave., CHICAGO, ILL.

Were You There? So Was I.



I'M Jake—getting down to work again after visiting the greatest convention in the history of the refrigeration industry. It is difficult to come down from the heights of such an affair and get down to the ordinary routine of one's daily work, but as if this is not enough, they have taken my partner away from me, and have now handed me a service kit, with the suggestion that I get to work, but before doing so, I want to give my impressions of the convention as I saw it.

Arriving at the Stevens in the early morning hours of Tuesday, the 2nd, I was much surprised to find many of the exhibits set up, the registration desk operating in full swing, and many visitors already on the scene. By Tuesday night, there were about 250 guests registered, even though the convention did not start until the following day. I learned that many of the visitors had been in town since Sunday.

The outstanding part of the convention was the fine display of exhibits by 74 of the manufacturers, jobbers and dealers in refrigeration parts and equipment. It took a full half-day to get around to see all of these and to learn something of each display. Outstanding among them were: *Alco Valve Company's* glass evaporator in operation with a thermal expansion valve, which showed the action of the gas in the tubes—the evaporator being so arranged that it could be turned to show a bottom feed, top feed, or vertical feed, thus giving a visual proof of the best manner of connecting; *Peerless of America, Inc.*, and the new type of coil displayed for the first time at this convention, which looks like a porcupine or a scrubbing brush—much more, I believe, will be heard of this coil in the near future; *Mueller Brass Company* and their tubular furniture made from hard copper tube and sweat fittings; *R. & H. Chemicals'* picture booth, where you could take your own picture in the garb of a convict or a scrub woman; *Ansul's* square B.t.u. factory, and after seeing this processing plant in miniature, there can be no question but that Ansul gas is better since it contains square B.t.u.'s—incidentally, did you win a box of cigarettes at this booth; *Copeland's* display and the R.S.E.S. refrigerated emblem, designed by Mr. Marvin Gammon and presented to the Society by the Copeland Company; the two display trailers—one used by *Langsen-*

Fun at the Convention—Upper left.—The Hoose Gow. Right.—Beer from the "Coltrol." Lower left to right.—The Ladies' favorite—the R. & H. Picture Booth. Shooting the little craps. Miss Christensen at the Registration Desk—No Phoney money here please.

Fun at the Convention—Upper left.—The Hoose Gow. Right.—Beer from the "Coltrol." Lower left to right.—The Ladies' favorite—the R. & H. Picture Booth. Shooting the little craps. Miss Christensen at the Registration Desk—No Phoney money here please.

Views of Monte Carlo night—Upper left—Just a little crap game. Right—The Auctioneer—Lower left—The line up at Ansul's 26 game. Right—Gamblers and more Gamblers.

kamp Company, of Indianapolis and the other by *Modern Equipment Corp.,* Defiance, Ohio.

It was interesting to note that not only were the service engineers of today there to see the show, but also the engineers of tomorrow. 85 students of the Lane Technical High School, in one group, visited the exhibits. Student groups from Coyne Electric and Crane High School, also attended.

Favors and Contests

Many of the exhibitors were giving away small favors to the visitors, and if you made a collection of them as you went around, you probably received: from *Detroit Lubricator Company,* a key ring; from *Harry Alter Company,* one of the familiar canes; from *Victor Manufacturing and Gasket Company,* a hot pan pad; from *Rex Refrigeration Service,* a glass ash tray; from *Penn Electric Switch Company,* a pocket screw driver; from *Rotary Seal Company,* square dominoes; from *Commercial Coil & Refrigeration Company,* a glass of beer from the "Coltrol"; from *Automatic Heating & Cooling Supply Company,* those trick pencils that everyone had so much difficulty in getting off; from *Chicago-Wilcox Company,* a key case; from *Ansul Chemical Company,* the square B.t.u.'s and a package of cigarettes, if you won them; from *Ranco,* a chromium-plated ash tray. In addition to these favors, several contests were being conducted, such as the following: *Borg-Warner*—$50.00 to the person guessing the number of flare nuts in the bowl; *Rex Refrigeration Service*—an electric clock and a cocktail set to the two nearest guesses of the number of beans in the bowl; *Peerless of America*—$50.00 for the best name for their new coil; *Virginia Smelting*—one prize of $25.00, and five prizes of $5.00 each for the naming of firms or individuals in the pictures shown.

It was a grand show, this exhibit, and there was a wealth of knowledge to be gained from it.

By the way, I heard that Herman Goldberg was awakened one day in the small hours of the morning to find a stranger gracefully reclining outside his door, snoring loudly, with a sign on his chest extending greetings to Herman. Did you hear that, too?

At the annual banquet, a very enjoyable time was had by everyone. Food could not be excelled, and the proportions were sufficient to satisfy the needs of any man, except possibly our Past President, Mr. Paul Jacobsen. The entertainment and the dance orchestra was of the best the city could offer, and I believe I can safely say that the 751 guests who sat down to dinner enjoyed every bit of it. A spectacular sight at this affair was the entry of approximately 40 waiters to the strains of a college march, bearing illuminated molds of ice cream, with the R.S.E.S. emblem on each. I did hear that one of the waiters tripped and spilled the works, but, of course, accidents do happen in the best regulated affairs. I only hope the ice cream did not come in contact with one of those bare backs!!!

The Carnival Night

The second night's entertainment was held in the Exhibition Hall, and took the form of a carnival night, with the lid on gambling entirely removed. Of course, it was all done with phony money, and when you saw men betting $10,000 at a 10 to 1 shot, you were glad it was. Prizes for the evening were auctioned off by a professional auctioneer, and here money flowed freely. It was just nothing in the lives of these people to spend $150,000 on a small electric clock, or $100,000 for a cocktail shaker. A squad of police and a portable hoosegow made frequent raids on the gamblers, shaking them down for heavy fines upon their release. Several enjoyable acts of entertainment were also a feature of this evening, including a very clever card trick by a magician. I heard a rumor to the effect that Mr. Tremblay, of Montreal, Canada, was in cahoots with this magician in the card trick. Is that right, Mr. Tremblay? By the way, did you see Mr. R. R. Dunlop, of Columbus, Ohio, dressed as a "forty-niner"? Yes, sir! He looked like a real old-time gambler in that get-up.

The third night's entertainment, although crowded, was a rollicking good time, with several more good acts, more good dance music, and just another good time. Incidentally, did you hear the few words of greeting so well spoken by Miss Christensen before the microphone?

The daily meetings and educational program, beginning at ten each morning, were very interesting and enlightening. To be sure, the Pittsburgh stogies received each morning at the door did not help the atmosphere at all, but inasmuch as they were given with the proper spirit, we could only accept them in the same way. The large Cana-

dian delegation made a fine showing, and were easily discernible in their blue hats with the Maple Leaf insignia. Bringing with them the distinction of being the largest chapter in the Society, they returned with the honor of a National Second Vice-President in their ranks—Mr. Burns, of Toronto, having been elected to that office. The most outstanding and memorable features of the educational program were the talk given by Mr. Stedman, of Milwaukee, and the motion picture entitled, "Heat and Its Control," presented by the Johns-Manville Corp. The enthusiastic applause that these two features received indicated the pleasure of the assembly in general.

I can only repeat once more that it was a grand show all the way through, and if it is an example of what the Chicago Committee can do, I am sure there are many who will live in anticipation of the time when they can again see a convention in the same setting.

And now—back to the old grind!

THE CONVENTION AS VIEWED BY THE LADIES

By MRS. H. BUSBY

THE convention is over but oh! what memories of it linger on! Looking back on those three days it seems that they were three full days of thrills and surprises.

The ladies' activities opened Wednesday morning with a meeting for the purpose of the visiting ladies to register their choice of trips to be taken to points of interest during the course of the ensuing mornings and afternoons. It was indeed a great thrill to find among the early arrivals at this meeting some visitors from our neighbor country, Canada—Mrs. Jas. Spence of Hamilton, Ont., and Mrs. W. E. Weaver of Toronto, Ont.

By popular vote, a trip was made Wednesday afternoon to the Planetarium where our party heard an intensely interesting lecture on the heavens. It was something different and everyone present expressed pleasure at having attended.

It is hard to say whether or not star gazing so long had anything to do with it, but, from that trip on for the duration of the convention, Mrs. T. A. Weichel of Elyria, Ohio, found herself hooked up in a relationship with Mrs. H. W. Blythe of Chicago which heretofore had never been dreamed of.

By the way, prior to leaving on this trip, Mrs. G. A. Larson of Madison, Wisconsin, became aware she was possessed of a sixth sense—an uncanny sense of leadership—which, however, got herself and her followers into more trouble than anything else.

On our return to the hotel, those ladies who had a little time to spare before getting ready for the banquet, hied themselves to the exhibition room to give the exhibits the "once over." More than likely a great many of the booths were a little too technical for our "weaker" minds so did get only a "once over," but everyone knows that the picture booth of R. & H. Chemicals Company and the "26" game of Ansul were very popular with the fair sex. Ask Mrs. Arnold Schroeder of Chicago how many sittings she had in a vain effort to get a picture of herself she thought worthy to give to her children for future reference. And it seems to me Mrs. George Monjian of Chicago was never a bit too tired to stand in line to play "26" and win a brand of cigarettes most distasteful to her husband; therein lies a mystery.

The Banquet

Wednesday evening, of course, was the banquet, and all the ladies were lovely indeed in their evening attire, making a perfect setting for an altogether grand evening. The orchestra was superfine, the floor show exceptional, and the meal excellent; it will take a long time to forget the thrilling effect brought about by the "ice cream fantaisie illuminated." As a compliment to the ladies attending, the Ladies Convention Committee had arranged to give to each a present, and it was nice to see the committee members, accompanied by waiters carrying the presents on silver trays, giving to each of the 285 ladies her little blue box tied with white ribbon containing the rhinestone combination pin and dress clips.

For Thursday morning trips to the Aquarium and the Field Museum of Natural History were the order, and Mrs. O. D. Sippel of Maple Heights, Ohio, was somewhat surprised when she found the bus scheduled for 10 o'clock had left without her when she arrived at noon.

A card and bunco party was held Thursday afternoon in the Tower Ballroom. There was a prize for the winner at each table and many door prizes had tickets drawn for them. We are still wondering what sleight-of-hand trick Mrs. John Barbagallo of

The Annual Banquet in the Grand Ballroom

Pittsburgh used to draw her own name as winner of one of those fine door prizes.

Thursday night was the night we all got a surprise—that of getting a surprise attack of tired aching feet; but some of us were favored with far more individual surprises. Take Mrs. R. R. Dunlop of Columbus, Ohio, for instance. She received a surprise, to say nothing of a great thrill, when her husband appeared before her in a made-to-order suit of the '49 mode; and another surprise when she learned he had presented a certain comely young woman with a ring of considerable distinction during the course of the evening. Her own words best express her feelings in the matter—"He's a divil!"

And Mrs. Albert Brandlein of Indianapolis and Miss Elvira Bossert of Chicago received thrills of a different type when they were taken for rides by the roller skaters.

Mrs. Harry DeGan of Chicago got a surprise and is still wondering why her husband spent so much money to win a golf bag at the auction when he doesn't even play golf!

To my knowledge the biggest surprise

of the Stevens Hotel—A Total of 731 were in Attendance.

Mrs. Guy A. Croston of Morganstown, West Virginia, received was when she found she was able to get up and get going again after she had taken most welcome possession of a lounging chair during the course of the evening.

Friday was the day of days for Mrs. Arnold Schroeder of Chicago. She experienced her supreme thrill in finding in the person of Mrs. Lewis of Sac City, Iowa, someone who had heard of her home town—Storm Lake, Iowa. Lucky thing for Mrs. Lewis she was just leaving town or she would have been in for something, I think.

Friday morning the ladies were conducted on a tour through Field's store and in the afternoon were "shown" Hotel Stevens. Even to the Chicago ladies themselves these trips proved most interesting.

Friday evening, the grand finale, made the convention a success as far as Mrs. George Uetz of Memphis was concerned for she had the thrill of hearing herself announced as a winner of $25.00 in the Peerless coil naming contest. What name did you suggest, Mrs. Uetz? We'd like you to

tell us so we'll know if it's selected as final choice.

Which reminds us, there's one thing we'd like to ask Mrs. Ivar Skipple of Chicago, and that is the secret of her speedy recovery. Friday morning she was in a bad way suffering from a terrible cold but that very night she was pretty hot when seen doing her stuff atop a table in the Tower Ballroom.

And might we ask Mrs. Paul Krueger of Chicago if the dance she and Herman Goldberg were executing might have been the "big apple"? Had we been aware of their skill beforehand, we might've had them take the place of Weckler & Wynnard, dance aristocrats, the night of the banquet.

Mrs. M. E. Harrison of Ashland, Kentucky, didn't confine her activities to the convention and was somewhat surprised to find that none of the shops in Chinatown were open around 4 A. M.

And Mrs. Claude Brunton somehow or another found time to do some shopping, be it window or actual. She received a bit of a surprise when, speaking of being in a certain loop store, someone made the suggestion of her being in a particular department. By the way, did you know June holds the distinction of being the only lady to have attended the four conventions held by the R.S.E.S.?

In spite of her weariness, Mrs. Chas. P. Eich of Youngstown, Ohio, was always ready to go anywhere any time, and, whenever we saw Mrs. B. M. McAlister of Memphis she appeared to be enjoying herself to a high degree.

We cannot help but feel, in view of the happy spirit which seemed to prevail everywhere at all times, that each and everyone attending enjoyed this convention to the fullest measure, and we hope to meet again at the next.

CHICAGO WINS GRAND PRIZE FOR MOST NEW MEMBERS IN CONTEST

FINAL results of the Membership Drive Contest from January 1 to June 30, of this year, were recently announced by National Secretary H. T. McDermott.

In this contest, two first prizes were offered, one to the chapter securing the greatest number of new members for the period, and one to the chapter securing the greatest percentage increase over its present membership. A second and third prize were also offered in the latter classification.

Following are the final results obtained by all chapters participating, together with the prizes awarded:

Chicago Chapter—Grand Prize—35 new members—$25.00.

Central New York Chapter—1st Prize—51 percent increase—$25.00.

Indianapolis Chapter—2nd Prize—50 percent increase—$15.00.

St. Joseph Chapter—3rd Prize—44.4 percent increase—$10.00.

Rockford Chapter—40 percent increase.

Chicago Chapter—38.4 percent increase.

Capital City Chapter — 37.5 percent increase.

Kansas City Chapter—36.3 percent increase.

Pittsburgh Chapter — 35.5 percent increase.

Twin Cities Chapter—12 percent increase.

St. Louis Chapter—8 percent increase.

Niagara Frontier Chapter—6 percent increase.

Ontario Maple Leaf Chapter—6 percent increase.

Memphis Chapter—2 percent increase.

M. H. Cullins
Indiana

Have been reading the SERVICE ENGINEER for sometime, and have found many useful hints from same. Would feel lost without it each month.

DAYTON CHAPTER NO. 1 ORGANIZES

THROUGH the courtesy and cooperation of Mr. T. C. Bickel of the Allied Refrigeration Parts, Inc., 68 Stratford Avenue, Dayton, Ohio, an invitation was mailed to refrigeration service men in the vicinity of Dayton to attend an informal meeting at the above company's offices on the evening of October 8th to determine the advisability of forming a local chapter of the R.S.E.S.

Mr. Wm. L. Drake, president of Indianapolis Chapter, attended the meeting and fully explained the purposes and objects of the Society as well as its advantages, and of the seventy-six men who attended the meeting twenty-one of them signed applications and the petition for charter at this first meeting.

Temporary officers were elected and arrangements made for holding a second meeting on October 22nd.

At the October 22nd meeting permanent officers were elected and installed as follows: E. O. Bowman, *president;* H. F. Pottenger, *1st vice-president;* John Becker, *2nd vice-president;* Robert Wilson, *treasurer;* Geo. O. Snyder, *secretary.*

ROCKFORD CHAPTER

Meeting of October 18, 1937

By L. L. STURCH, *Treasurer*
1915 Vernon St., Rockford, Ill.

MEETING called to order by President R. C. McCarthy.

A lengthy discussion was held in regards to a proposed stag which had been pending for some time. It was finally decided to hold the stag on November 18. Turkey and chicken raffles were decided upon as a means to raise money and prevent a drain on the treasury. Earl Seaton, Don VanDenberg and Henry Genin were appointed as a committee to make all the necessary arrangements.

President McCarthy then read a letter from National Secretary H. T. McDermott regarding the convention credentials for delegates to the convention. R. C. McCarthy was elected delegate, with Fred Barney as alternate.

The meeting was turned over to Past-President George Moon for election of officers for the coming year. The results of the election were as follows: R. C. McCarthy, *president;* Roy Shipman, *vice-president;* Henry Genin, *2nd vice-president;* Walter Larson, *secretary;* Leslie L. Sturch, *treasurer;* Roy Erickson, *sergeant-at-arms;* Fred Barney, *educational chairman;* Harry Wardecker, Chas. Billmyer and Harry Lindquist, *Board of Directors.*

Before turning the meeting back to President McCarthy, Mr. Moon read the poem which follows. This verse was written into the minutes of the meeting, and we believe it contains a thought for every member of the R.S.E.S.

Do You Just Belong?

Are you an active member
The kind who would be missed?
Or are you just contented
That your name is on the list?

Do you attend the meeting
And mingle with the crowd?
Or do you stay at home
And crab both long and loud?

There's quite a program scheduled
That means success if done,
And it can be accomplished
With the help of everyone.

So attend the meetings regularly
And help with hand and heart.
Don't be just a member
But take an active part.

Think this over, member
Are we right or are we wrong?
Are you an active member
Or do you just belong?

This handsome group is the result of an invitation recently from the Central New York Chapter. The occasion was a Clam Bake. Imagine their capacity for clams!!

OHIO STATE ORGANIZATION FORMED

Meeting of October 9, 1937

By MARTIN BOKESCH, SR., Secretary
Youngstown, Ohio

THE meeting was called to order by temporary chairman, Martin Bokesch.

Four of the six Ohio chapters were represented, namely: Cleveland, Akron, Youngstown and Columbus. Those in attendance were: T. Sutton, Cleveland; Lawrence Gardella, Cleveland; L. E. Mack, Columbus; Otto Sipple, Cleveland; R. E. Yeager, Columbus; Charles Hall, Akron; George Schuld, Cleveland; N. K. Mason, Columbus; M. Bokesch, Youngstown; C. P. Eich, Youngstown; W. W. Farr, Cleveland; J. Downs, Cleveland.

Temporary officers to serve the state organization until the beginning of its fiscal year, July 1, 1938, were elected as follows:

C. P. Eich—*President.*
G. Schuld—*Vice-president.*
M. Bokesch, Sr.—*Secretary.*
R. E. Yeager—*Treasurer.*
Otto Sipple—*Sergeant-at-Arms.*

The Board of Directors will consist of the temporary officers, and the president of each of the six Ohio chapters.

The new temporary president took the chair and asked for suggestions on business to be discussed before the group. The following suggestions were made: 1. A Constitution and By-Laws, conforming to the National Constitution and By-Laws be adopted. 2. Finances to operate the organization be discussed. 3. Methods of forming closer association between Ohio Chapters be discussed. 4. Methods to help the National Organization expand in Ohio be discussed. 5. Plans be made to hold a State Convention each year previous to the National Convention. 6. Plans be made for a State Educational Program, with an Educational Director to be appointed by the temporary president at a later date after he has had an opportunity to select an outstanding candidate.

Secretary Bokesch made a motion to assess each Chapter in the amount of ten dollars, with the exception of the Cleveland Chapter whose assessment would be fifteen dollars, and the Akron Chapter whose assessment would be five dollars; all money to be payable to the temporary treasurer. Motion was seconded by L. Gardella, and passed.

Mr. J. Downs made a motion to maintain state headquarters at the National Convention to register all members attending the Convention from the State of Ohio. Motion was seconded by Mr. Otto Sipple, and passed.

It was decided that the new officers would have the right to use the money in the treasury as they saw fit in order to facilitate organizing quickly.

It was decided that before the next meeting an effort would be made to acquaint themselves with all members-at-large in the State of Ohio, and to acquaint themselves with the procedure of securing proxies to vote for absent members at the National Convention.

TRI-COUNTY CHAPTER

Meeting of October 4, 1937

By B. V. CLARK, *Secretary*
612 N. May St., Aurora, Ill.

THE meeting was called to order by President Harvey Burgess. The minutes of the last meeting were approved as read.

Following a short business session, Secretary Clark read a communication from National Secretary H. T. McDermott regarding the appointment by the chapter of a delegate and alternate to the national convention. Before the nominations were made the tentative program for the three days of the convention was outlined by Mr. Willis Stafford, educational director. The delegate elected Mr. Cecil York, alternate, Mr. Eugene White.

Mr. Stafford's suggestion that we hold a joint meeting with the members of Rockford Chapter, in Elgin, was approved by the president. A motion was made by Mr. Kenneth Pentz and seconded by Mr. E. H. White. Motion carried. It was decided that a speaker for this joint meeting would be secured by Mr. Stafford.

As an educational feature Mr. Stafford read and discussed the findings of the investigating committee regarding the oxygen and oil explosion at the Mayfair Grill, Chicago, as written up in a recent issue of "Air Conditioning and Electric Refrigeration News." This report was very well received.

Meeting of October 18, 1937

Meeting called to order 9:10 p.m., in Elgin, with 17 members present. Reading of minutes of previous meeting approved as read. Certificates of membership were presented to four new members: Mr. Paul Seifrid, Aurora; Mr. Francis Covalt, Aurora; Mr. Eugene White, Elgin; Mr. Chas. Singer, Elgin.

Two committees, a Membership Committee and an Amusement Committee, of three

members each, were appointed by the Chairman.

Motion that we hold our next regular meeting on November 15 instead of November 1, at Joliet, at which we would have a dinner meeting, was seconded and approved.

Delegates were instructed to approve the set of resolutions as outlined in the October REFRIGERATION SERVICE ENGINEER, which appear under the heading, "Refrigeration Dealers, Jobbers Find Evils of Industry."

Meeting adjourned at 10:25 p.m., followed by refreshments.

THEY COULDN'T HAVE BEEN DAISIES

AT the National Convention several of the Mississippi Valley Chapter boys had the honor of picking themselves a beautiful bouquet of flowers from the large vases in the lobby of the Stevens Hotel. It seems that the House Detectives objected but shortly thereafter the Mississippi Valley Chapter boys were introduced to the House Detectives and found that they weren't such a bad sort after all.

THE "CONTRIBS' COLYUM"

By THE KINGFISH

IT'S all over now.
The grandest show we ever had.
Seventy-five beautiful and crowded exhibit booths.
Two trailers—one from Langsenkamp and one from Modern Equipment Corp.
Turkey and all the trimmings at the banquet.
The procession of waiters with the gorgeously illuminated ice cream dessert—initialed R.S.E.S.
First class entertainment.
The two most constantly crowded booths—Ansul's 26-game and DuPont's picture taking machine.
The excellent service at the Stevens Hotel.
Peerless new "Porcupine" Coil.
The motion picture—"Heat and Its Control."
The Monte Carlo Night.
Our grandstand view of Grant Park, with its maze of traffic and beyond that blue Lake Michigan.
Pittsburgh Stogies.
Lively discussions on the floor.
W. Hall Moss for President.
The Tower Ballroom.
Where did the ladies ride?
Stedman's talk on "Merchandising."
What causes copper-plating in a methyl chloride compressor?
No water on the speakers' platform.
Herman Goldberg.
Service engineers from nearly every state in the Union and from many places in Canada.
Men from London, England, and Buenos Aires, Argentine.
Mr. J. F. Nickerson's talk.
The efficient convention committees.
W. D. Ambrose and his Mills Gang.
Suave Dan Wile.
How many beans in the jug, Shroeder?
Paul Jacobsen retiring.
Joe Askin's coil data.
The Continental Room.
Clark and McGovern answering the numerous questions.
Air-conditioning as seen by W. S. Bodinus.
A Frigidaire thermostatic expansion valve.
Edna Christensen presiding in the registration booth.
McDermott's usual worried expression.
The Ontario Maple Leaf Chapter.

ST. LOUIS CHAPTER

Meeting of September 23, 1937

By E. A. PLESSKOTT, *Secretary*
2145 67th St., St. Louis, Mo.

THE regular meeting held at the German House September 23rd was called to order by President E. Gygax.

Mr. L. Krueger, erst-while picnic camera man, exhibited his handiwork—some action films taken at the recent picnic. At the conclusion of this showing Mr. Gygax gave some very interesting information on refrigeration conditions in India.

Discussion of the probable cause of copper plating in compressors followed and several methods of oil testing to check moisture content were given by Mr. Gygax. Mr. Krueger is to contact the Frigidaire Corp. and make arrangements with them for meeting of December 9th.

Meeting of October 14, 1937

Correspondence from the National Convention Committee and the St. Louis Community Fund was read and discussed.

In the absence of Educational Chairman O. Tinkey, the speaker of the evening, Mr. E. H. Schutt, of the Trane Co., La Crosse, Wis., was introduced by Mr. Gygax.

He gave a most interesting talk on coil design and application to various conditions —giving freely of his experience from a practical standpoint, answering many questions by recalling installations previously

made in which the same problems had been overcome. Each member present was supplied with a catalog of the complete Trane Company line of coils as well as data for figuring various applications.

After some discussion, unanimous selection of Secretary Plesskott and Vice-president Vollman to act as delegate and alternate respectively, with the provision of an allowance for the one acting was made. Secretary Plesskott requested that if there were to be any instructions for the delegate or alternate they should be discussed at the meeting of October 28th as this would be the last meeting prior to the convention, and unless instructed explicitly they would use their own judgment.

MISSISSIPPI VALLEY CHAPTER

Meeting of October 8, 1937

By **E. L. BENGSTON,** *Secretary*
116 E. First St., Davenport, Iowa

DUE to the absence of both the President and Vice-President, the meeting was opened by Secretary Bengston who introduced the educational speaker of the evening, Mr. R. Douglas Marshall, representative of The Automatic Products Company. Mr. Marshall gave a very interesting talk and, with the charts that he had with him, gave a very thorough description of the automatic and solenoid valves. The talk and description was greatly appreciated by all members.

The minutes of the last meeting were read and approved, following which the treasurer's report was given and accepted.

Motion was made by Mr. Otto Balke that fifteen dollars be allowed the delegate for expense of his trip to the National Convention. Motion was seconded by Mr. Wolcott. Before the names were to be suggested for the delegate and alternate, the names of those men who had always attended the meetings were read, as follows: Mr. Leonard C. Nelson, Mr. E. J. Ford, Mr. E. L. Bengston, Mr. Ed Dick, Mr. Wilbur Cawiezell and Mr. Clarence A. Teagarden. It was then decided that the delegate and alternate should be chosen from these names and Mr. Bengston received the largest number of votes. Mr. Bengston expressed his appreciation for this honor but declined in favor of the two next highest. Mr. E. J. Ford was thereby elected delegate and Mr. Leonard C. Nelson, alternate. The Chapter is very happy to be represented by Mr. Ford as he was the first charter member of the society as well as the first member to pay his dues.

Following the business session, National Secretary H. T. McDermott gave a very interesting talk on the fourth annual convention and exhibit which is to be held at the Stevens Hotel, Chicago, November 3, 4 and 5. All of the members of this Chapter appreciated the effort put forth by Mr. McDermott in order that he might attend this meeting and advise us regarding the convention.

Mr. J. S. Kimmel, president of the Republic Electric Company, was next introduced and he gave a very interesting talk on the convention and exhibit held in 1936, at Memphis, Tenn.

Quite a number of prospective members were in attendance and there was a fine turnout. Two new members were received into the chapter at this meeting; namely Mr. E. J. Soens, of Iowa City, and Mr. A. E. Wixon, of Rock Island, Ill.

A party followed adjournment of this meeting.

MEMPHIS CHAPTER

Meeting of September 8, 1937

By **J. H. RIEHLMANN,** *Secretary-Treasurer*
3077 Summer Ave., Memphis, Tenn.

FIRST VICE-PRESIDENT W. H. MOSS called the meeting to order with the required number of officers and members present. Minutes of the last meeting were read and approved.

Two new applications for membership had been received — Harry A. Simpson and Ernest A. Sparrow.

Various communications were then read, followed by reading of accounts payable. The invoice from Davidson & James for $3.00 was read. Motion was made by Mr. Weidlein that Secretary Riehlmann get in touch with Mr. Geo. Uetz regarding this account and if same had not been paid then the Secretary be authorized to issue payment. Motion carried.

Messrs. Weidlein, Gibson and Kellogg were appointed on a special committee to act on the applications of E. A. Sparrow, Wm. W. Conard and Harry A. Simpson.

One of our members then gave a talk on why we should belong to the national organization and why we should attend all meetings.

Meeting of September 22, 1937

The meeting was called to order by Vice-president W. Hall Moss, with a goodly number in attendance.

Mr. Moss and Mr. Weidlein requested that

Secretary Riehlmann prepare a list of all delinquent members so that they might be called on personally and reinstated in the Chapter, with the idea of payment of only $5.00 for dues from July 1, 1937 to June 30, 1938.

At the close of the meeting Mr. E. A. Sparrow won the jackpot of $2.35 which the members had chipped in. Mr. Sparrow then started another jackpot for the next meeting by donating fifty cents.

COLONELS CHAPTER ORGANIZED

Meeting of September 30, 1937

By A. E. STUCKERT, *Temporary Secretary*
402 E. Market St., Louisville, Ky.

A MEETING of the Refrigeration Service Engineers Society was called on September 30 at the Commercial Hotel, 412 E. Market St., Louisville, for the purpose of discussing the advisability of forming a chapter in Louisville.

Mr. Arthur B. Dehler introduced National Secretary H. T. McDermott who fully explained the purposes and objects of the society.

By unanimous consent it was decided to form a Louisville Chapter and the following temporary officers were appointed:

W. H. Eickmeyer, *Temporary Chairman.*
A. E. Stuckert, *Temporary Secretary.*
Ray Olive, *Temporary Treasurer.*

Application blanks were then signed and an application for charter was made.

It was moved, seconded and duly carried that the next meeting of Louisville Chapter would be held on October 14, at the Commercial Hotel, at which time initiation fees and dues would be collected.

A Membership Committee was then appointed by Chairman Eickmeyer as follows: David J. Stearman, Len Fulkerson, Ray Olive, W. H. Eickmeyer, Homer Schuell and A. E. Stuckert. New members were invited.

Decision was made to send out cards notifying members of the meeting on October 14th, and a vote of thanks was given to Mr. Dehler for having arranged this meeting.

Refreshments were then served.

VIEWS AND REVIEWS

by HERMAN GOLDBERG

IT is my sincere desire in writing this article to first express the great appreciation of all members of the Chicago Chapter for the wonderful attendance record of the visiting chapter members to our Chicago convention. We feel we have been deeply honored.

As General Chairman of the Convention Committees, I again wish to publicly thank the following men who unselfishly gave of their time and ability to make our convention such an outstanding success:

Irving Alter, H. W. Blythe, B. B. Dawes, Harry Drownes, George Franck, Wm. Hauber, Ray Johnson, George Monjian, Ray Polley, Fred Roth, Arnold Schroeder, E. W. Scotten, Willis Stafford, and the Board of Directors of the Chicago Chapter, Ivar Skipple, Percy Bossert, Arnold Schroeder, Joe Corso, D. Armstrong and A. E. Karlberg.

We also wish to thank the members of the Refrigeration Supplies and Parts Manufacturers' Association and the members of the National Refrigeration Supply Jobbers' Association who embodied their activities with ours.

The Chicago Chapter considers it a great privilege to have had the opportunity to act as host to these two very important organizations in conjunction with our R. S. E. S. convention. Perhaps our convention in Chicago, through its wide scope, will open the way to bigger and better conventions in the future, and we feel that it is only through conventions of this calibre that our entire industry can materially benefit.

CHICAGO CHAPTER

Meeting of September 28, 1937

By WILLIS STAFFORD, *Secretary*
726 Hinman St., Aurora, Ill.

THIS meeting was called to order by President I. Skipple, with all officers being present. The minutes of the last meeting were approved as read.

Secretary Stafford read a letter from the National office stating that Chicago Chapter had won the twenty-five dollar prize on the recent membership contest for securing the largest number of new members. The chair complimented the Membership Committee for their splendid work.

President Skipple read the resignation of Mr. R. Hendrickson, chairman of the Chapter Educational Committee. The chapter accepted this resignation with regret and extended best wishes to Mr. Hendrickson for success in his new location in Nebraska. The chair then appointed Mr. Harry Busby to assume chairmanship of the Educational Committee, to be assisted by the Examining Board which has been merged with this committee for this purpose.

Mr. Fred Roth read several resolutions drawn up by other refrigeration organizations regarding various trade practices and policies. The Chapter had been asked to endorse these resolutions which are to be presented at the Jobbers' and Manufacturers' Convention in November. Motion was made by Mr. Geo. Monjian that the chair appoint a committee to act upon these resolutions, approving or disapproving their stipulations. Motion was carried. Mr. Herman Lang then made a motion that this committee have final power to act on these resolutions. Motion was carried.

Mr. Herman Lang reported that he and Mr. Joe Gross would soon start on a vacation tour of the southwest, expecting to visit as many chapters as possible for the purpose of inviting them to attend the Convention. The chair officially appointed Mr. Lang and Mr. Gross "The Good Will Convention Committee."

Mr. Harry Busby gave an interesting demonstration of a new type Turner gasoline torch.

Meeting of October 12, 1937

As soon as the meeting had been called to order, President Skipple read a discussion of the new city code, to be used as an educational program. Comments were made by various members, and the meeting was then turned back to the regular business session. Minutes of the previous meeting were read and approved.

Secretary Stafford read a letter from Mr. C. O. McCauley, of Pittsburgh, chairman of the National Membership Committee, congratulating Chicago Chapter on winning the prize in the membership contest.

An announcement was made by the Entertainment Committee of a pre-convention ball to be given by the Convention Committee October 23, Stevens Hotel—a free affair.

Mr. Fred Roth reported that the resolutions which were read at the last meeting were being accepted favorably by parts manufacturers and jobbers. The committee appointed to act upon these resolutions was composed of Mr. Arnold Schroeder and Mr. Walter Lowitz.

National Secretary H. T. McDermott reported that from all indications throughout the country the convention will be an outstanding success—73 exhibitors having so far taken space.

The next order of business was an election of delegate and alternate to the National Convention. The delegate elected was Mr. Joe Corso and the alternate Mr. Harry DeGan. Both men were elected unanimously.

Mr. Fred Roth requested that the delegates be instructed to vote favorably for the resolutions mentioned above. Mr. Roth asked Mr. H. W. Blythe to arrange a place on the program of the National Jobbers' Association for these resolutions to be presented.

Meeting of October 26, 1937

A motion was made and carried that our next regular meeting of November 9th be cancelled inasmuch as it was so soon after the national convention.

Mr. H. Goldberg reported at length on the activities of the General Convention Committee. Several questions were asked from the floor regarding costs and various events.

Motion was made and passed that the convention program be approved by the chapter up to the present.

National Secretary H. T. McDermott complimented Chicago Chapter on its work in planning the convention.

After some discussion, motion was made and carried that Chicago Chapter go on record as endorsing the Fair Trade Practice resolutions read at the last meeting. Instructions were given to the delegate to the convention to endorse the above mentioned resolution.

After several motions and counter-motions the members present voted by secret ballot to instruct the delegate to introduce Mr. W. Stafford's name to the National Nominating Committee for a member of the National Board of Directors.

KANSAS CITY CHAPTER

Meeting of October 26, 1937

By S. A. LEITNER, *Acting Secretary*
3112 Holmes St., Kansas City, Mo.

MEETING called to order at 8:45 p.m. by President Green. After roll call of officers and members, the minutes of the meeting of October 12 were read and approved.

The application of Mr. Chas. Stein for active membership was read and referred to the Membership Committee for investigation.

President Green recommended that the Membership Committee find out from applicant who his present and former employers are, and where he received his training, and other details that were not on his application. He also stated that Membership Com-

mittee should exercise more care in approving applications from now on, and to insist on certain obligations before applications will even be given any consideration. The obligations were of the following nature: applicant must promise to take an active part in all proceedings, attend all meetings, must be prompt in the payment of his dues, etc.; and he also asked the members to give the officers their support whenever possible.

The application of Mr. E. L. Tramposh was voted upon and unanimously accepted for membership. Mr. Tramposh was present at the meeting and after voting him to membership, President Green asked him to make a few remarks, which he graciously did. Mr. Tramposh has always been active in Society affairs through his employer, and the Chapter feels rather fortunate in having him as a member.

There were no reports from the standing committees. Special Committee on collection of delinquent dues since the last meeting have responded very satisfactorily, and the collection of dues resulting from their efforts were quite noticeable.

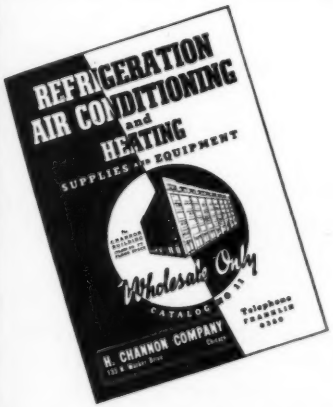
Several remarks made by some of the members for the good and welfare of the Society were taken very seriously, and these remarks will be used to stimulate activities at a future date.

The reading of special letters and communications by the President and Secretary followed, and any necessary action will be attended to by the officers and committees.

Comments were made by the Secretary in regards to the proper method of filling out applications so that all applications turned in can be referred immediately to the Membership Committee. No application not properly filled out will be accepted for consideration.

The convention plans were discussed, and from the spirit displayed, Kansas City Chapter will be well represented at Chicago.

President Green requested that all members of our chapter attend all sessions of the meetings, and attend in a body, to take a lively interest in all proceedings. Also, he asked that all members attending report to Delegate DeWilde upon arrival, in order to obtain a list of those from Kansas City, and make up a roster of names and room numbers, so that any member can be located when wanted. He also asked the members to report to Acting-Secretary Leitner in case of grievances and difficulties in regards to registration, rooms, etc. President Green



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then told the members that he hoped this convention would impress those attending, and imbue them with a spirit that would be displayed in our chapter for the coming year.

Communication from Harry D. Busby, Chicago, re: "Unit Labor Survey" questionnaire was read and is to be taken up after the convention. No further business and meeting adjourned.

Meeting of November 9, 1937

It was a pleasure to have with us at the meeting Mr. E. J. Newcomer, new member-at-large, of Wakeeney, Kansas, who was called upon to make a few remarks regarding the convention.

The application of Mr. Geo. W. Baile for associate membership was read and referred to the Membership Committee for investigation. The Membership Committee reported no action on the application of Mr. Chas. Stein, which was referred to them at the meeting of October 26th, due to the fact that this committee was attending the convention. The Committee promised to report on this application at the next meeting.

The report of the special committee, which consisted of Delegate J. P. DeWilde and other members who had attended the convention, was next called for by President Green. Delegate DeWilde was first called upon to make his report. After his report the members who had attended the convention—Messrs. Bloesser, Ryan, Thompson, Fromholtz and Leitner—were called upon for reports.

It was evident from the reports received that the Chicago convention was a huge success and that all those who attended benefited to a great extent and considered the time and money spent well worthwhile. They gained much and were impressed by the business-like manner in which the convention was conducted, and have learned that the R.S.E.S. is a thriving, progressive organization, worthy of affiliation, and an organization to be proud of. It was also noted that the Society commands national attention and recognition, the respect of manufacturers and jobbers, and other concerns allied with the refrigeration industry. Salient facts and figures of the convention and the organization were presented by the Acting-Secretary.

President Green instructed Acting-Secretary Leitner to send a special letter to Chicago Chapter on behalf of Kansas City Chapter commending them on the splendid manner in which the convention was presented.

The Secretary was also instructed to send letters to all of the new officers and directors, wishing them success and pledging them the support of Kansas City Chapter during the year 1938.

The Unit Labor Survey questionnaire was again presented at this meeting and after discussion was turned over to Mr. Thompson, who will make an effort to fill out this questionnaire to the best of his ability, and to make a report of his progress at the next meeting.

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MILWAUKEE CHAPTER

Reorganization Meeting of October 5, 1937

By C. E. HAMILTON
925 W. Wells St., Milwaukee, Wis.

AT the reorganization meeting of Milwaukee Chapter about twenty men were present, all of whom are interested in building up Milwaukee Chapter again.

It was definitely decided that no attempt be made to make Milwaukee Chapter metropolitan, but to attempt to gain a membership from the surrounding territory. To give those from Racine, Kenosha and other nearby cities a direct interest in the chapter, it was decided that the meetings should be held periodically in these out-of-town cities on regular meeting nights.

A general discussion was then held on various topics, and the date for the next meeting will be announced later.

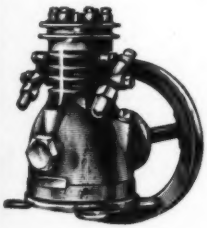
SALE OF NATIONAL CONTROLS SHOWS INCREASE

EVEN though the former National Regulator Company, manufacturers of pneumatic controls and control systems for heating, ventilating and air conditioning, has been a part of the Minneapolis-Honeywell Regulator Company for only six months, the increase in orders received has already made necessary the speeding up of production through the addition of new factory machines, equipment and personnel.

J. E. Haines, formerly assistant manager of the Minneapolis-Honeywell Modutrol Division and now assistant manager in charge at the National factory in Chicago, announced that all old National employees have been retained with the firm although the entire organization has been broadened greatly to increase the facilities for engineering, service and field work.

The National Regulator Company for over thirty-five years supplied the heating, ventilating and air conditioning field with dependable air-operated controls and control systems. With its vast experience both in laboratory research and in the field National has developed a line of controls that is complete and reliable throughout.

For this reason Minneapolis-Honeywell is not contemplating at this time any immediate changes in the basic construction and operating characteristics of National controls. National's "Helmet-Sealed" thermostat, however, has been outwardly redesigned to in-



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are designed to give you many years of quiet, efficient and trouble free service by Engineers who have been serving the refrigeration industry for the last fourteen years.

They have again "scored a hit" with a new "V" type four cylinder compressor which is designed for use with ½ to 1 HP motors. All of the advanced features that have proven so successful in "Chieftain" household and light commercial units are now incorporated in this new four cylinder model.

Mechanical improvements include, force feed lubrication to piston pin and connecting rod bearings, positive alignment of cylinder bores with main bearings by casting cylinders and crankcase in one piece. Adjustable suction shut-off valve, interchangeable parts with single and twin cylinder models. All compressor parts are machined to precision limits on up to date equipment and assembled in glass enclosed rooms where only filtered, dust free air is admitted.

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clude the modern and attractive cover as adopted by Minneapolis-Honeywell several years ago in its "Acratherm" line. This line was styled by Henry Dreyfuss, world famous designer.

Work on revising the National catalog and sales literature has been completed. Catalog information is now available in conjunction with Minneapolis-Honeywell instruments or in separate publications, and those interested can obtain copies of this material by writing the National Regulator Division in Chicago or the Minneapolis home office of Minneapolis-Honeywell.

NEW KRAMER CATALOG

A NEW 48-page catalog of Kramer coils, radiators and special devices for cooling, heating and refrigeration, has just been released by Trenton Auto Radiator Works, of Trenton, New Jersey.

The catalog, in addition to listing the products of the company, gives some interesting data on figuring size of coils, determining loads for various boxes, display cases, etc., and other engineering data.

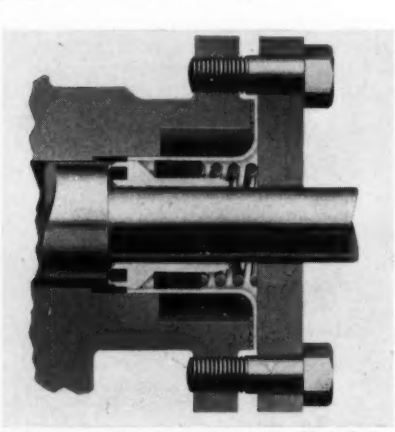
Your copy may be secured from the company at Trenton, New Jersey.

NEW PEERLESS HEAT TRANSFER SURFACE

After several years of study and experiment a new type of heat transfer surface has been developed, which made its first public appearance in the booth of Peerless of America Inc., during the recent R.S.E.S. Convention. The following is a description by Mr. A. F. Hoesel their chief engineer.

A STUDY of related heat transfer, as revealed in domestic and foreign literature, also in patents, reveals that the first form of such apparatus consisted of piping arranged in nested form. Since the cost of such apparatus was comparatively high, for a given heat load, the economic pressure finally evolved the use of plates or fins attached to the piping in order to increase the effective heat transfer surfaces, thereby reducing the cost of the apparatus for a given heat load condition.

Since economic pressure is an ever present force, there was finally evolved, through the trial and error method in general, the various limitations of plate and tube dimensions which would give the greatest heat transfer value for the least amount of expense. At this point, it seemed practically impossible to increase the amount of heat



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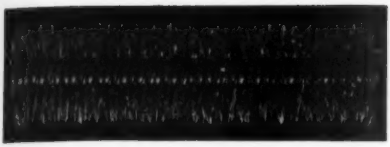

SECTIONAL VIEW OF NEW PEERLESS COIL SURFACE.

transfer for a given sized unit, other conditions being equal, except by the use of thicker fin plates which would reduce the temperature differential between the pipe and the extreme portion of such fin plate served by that particular pipe.

At this point, Peerless engineers—realizing that the greatest amount of heat transfer in a refrigerant cooling unit took place at the refrigerant wetted internal surfaces of the tubing which, in horizontal tube circuits, is the bottom portion of the tube—started the use of Rifling.

Peerless Rifling is a particular method of providing a spiral path adjacent to the inner walls of the refrigerant tubing, whereby, with the proper proportions of this spiral path, the refrigerant vapor velocity is partially transformed into a rotary motion, which carries the refrigerant liquid all around the inner walls of the tubing and gives a 100 percent wetted surface.

The average heat absorption of a finned cooling unit is increased by 30 percent with the use of properly proportioned Rifling.

Since Peerless engineers, by the use of Rifling, increased the internal efficiency of the tube, they were now concerned with increasing the efficiency of the heat transfer from the air to the outer surfaces of the cooling unit.

A finned cooling unit was built and tested for its heat absorption capacity under certain conditions, and the results tabulated. Then the fins were shredded, by means of a special tool, and the former tests duplicated. The shredded fin coil showed an appreciable increase in heat transfer, under similar conditions, as compared to the coil prior to shredding.

Realizing the importance of this discovery, Peerless engineers were then concerned for several years with developing machinery for producing a shredded fin coil. Numerous designs of machinery were worked out and methods of shredding were experimented with, until the present form of surface and its particular method of manufacture was evolved.

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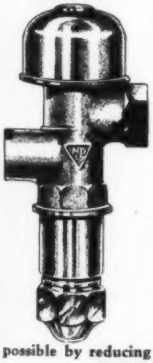

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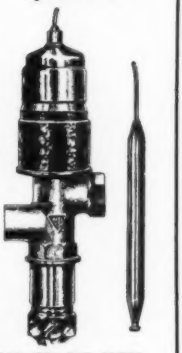

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Prior to building a complete automatic machine, it was decided to recheck this particular type of surface for efficiency as compared to the normal fin type. Therefore, two coils were made identical with each other, except that one coil had solid fins encircling the tube and integral therewith, while the other coil (constructed in the same manner and of identical proportions) was slot-milled so that each fin was cut into 36 projections. This slot-milling involved the removal of 40 percent of the original fin surface.

These two coils were now tested out simultaneously under identical conditions of air temperatures, volumes and velocities, also refrigerant temperatures; and, paradoxically, the slotted fin coil having 40 percent less fin surface showed a 51 percent increase in heat absorption capacity over the heat absorption capacity of the fin coil having 100 percent fin surface. The slotted fin coil showed over twice the efficiency of the non-slotted fin coil.

After this test, which conclusively demonstrated that this particular type of coil had a definite economic position in heat transfer problems, the automatic machinery was then constructed and proved satisfactory upon test.

While it is impossible to enumerate all of the practical problems encountered during the experimental stages in attempting to raise a sliver-like portion from and perpendicular to a tube wall, the method finally used is simplicity itself and capable of very wide variation as regards the number of spines per square inch of tube surface, the height of the spines and also the cross-sectional area of the spines. At present, Peerless can fabricate this type of surface in 96 combinations for a given tube size.

The automatic machinery fabricates this particular type of surface on tubes made of steel, copper, aluminum and, in fact, any material capable of being machined.

NEW FRIGIDAIRE DIRECT DRAW BEER COOLER

THE fundamental principle underlying the system is that all primary cooling of beer is done inside the keg itself. Kegs may be placed under the bar counter and beer drawn direct without the use of novelty boxes, cooling coils and other accessory

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equipment. This method completely eliminates the necessity of periodic coil cleaning and sterilizing, one of the most troublesome duties connected with the maintenance of sanitation. The complete system consists of four basic divisions or units; namely, a refrigerating compressor, a water cooler and circulator, a transmission manifold to be concealed under the counter, and a water coil built into each keg. Coils manufactured by Frigidaire Division are built into kegs by the cooperage company or brewery as a permanent part of the keg itself, and remain the property of the brewery.

The manifold, extending approximately the length of the bar, carries under heavy insulation, a complete circuit of water lines to and from the water cooler, through which sweet water is under continuous circulation at the desired temperature. Outlets, with flexible connections and necessary shut-off cocks, are provided at intervals along the length of the manifold.

When beer is delivered, regardless of whether or not it is to be tapped immediately, kegs can be placed under the bar counter, and in a matter of seconds, connected to the manifold by means of the flexible connectors provided. At the keg, these connectors are attached to the built-in cooling coil, and with a flip of the finger opening the shut-off cocks, the cold water immediately circulates through the kegged beer, either reducing its temperature or maintaining the proper temperature, depending upon the condition of the delivered beer. All cold water passing through a tapped keg must also pass through a cooling jacket built around the tap rod so that the beer is constantly kept at the correct temperature right up to the faucet itself. Thus, beer standing in the tap rod up to the faucet is just as cold as that in the keg. All beer on hand, whether tapped or not, is under refrigeration.

When a keg is ready to be tapped, it need not be moved, although it may easily be moved if this is desirable for any reason. Normally, a tap rod from an empty keg would simply be removed and taken to a fresh one, inserted in the regular manner, and service is immediately resumed.

The water cooler, concealed under the counter, or other convenient location, incorporates all the standard water cooling practices. Flow of water through the manifold

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No. ES5 - The Biggest Little Set Made

FORTY-THREE small and miniature tools—in a convenient, enameled metal box—comprise the No. ES5 Set.

Included are sockets with openings from ¼" to 7/16" for ¼" square drive and attachments, box wrenches with openings from 5/16" to 11/32", open-end wrenches with openings from 5/16" to 15/32", punches, chisels, screw drivers, hammers, plier, point file, tweezer and a holding tool.

This set is ideal for repairs and adjustments to motors, small electrical apparatus, radios, etc. where parts are small and space in which to work is limited. Fully illustrated and described in Catalog No. 137, along with hundreds of other sets and individual tools for practically every refrigeration service job. Write for your copy today.

BONNEY FORGE & TOOL WORKS
ALLENTOWN, PA.
Stocked by Leading Jobbers Everywhere

Catalog No. 137 fully describes the No. ES5 Set and the full line of Bonney Tools. Mail the coupon today!

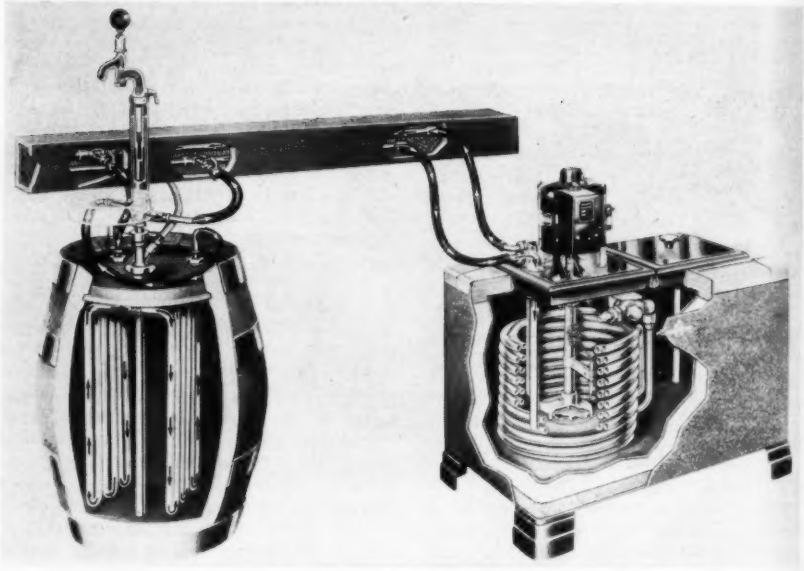
MAIL THIS COUPON TODAY

Mail me a copy of Catalog No. 137 describing the No. ES5 Set and the full line of Bonney Tools. R.S.E.—117

Name .....

St. & No. .....

City & State .....



FRIGIDAIRE DIRECT DRAW TYPE OF BEER COOLER.

TWO NEW TUBE BENDERS that make tubing work easy to handle

AMONG the many Imperial service aids that speed up installation and service work are two new tube benders.

You will want to try out the new No. 364-F hand tube bender. It's a very inexpensive tool and yet with it you can make neat and accurate bends quickly and easily. Bending shoe slips over the tube and bends the tubing around the form.

Furnished in nine sizes to take 1/8", 3/16", 1/4", 5/16", 3/8", 7/16", 1/2", 5/8" and 3/4" tubing.

The new 460-F bender not only makes all types of bends but has the added advantage of forming round and obround coils—something *entirely new* in tube benders. Furnished in four sizes—3/8", 1/2", 5/8" and 3/4" tubing.

● Call your jobber and try out one of these new tube benders. ●

THE IMPERIAL BRASS MFG. CO.
1204 W. Harrison St., Chicago

No. 364-F Tube Bender

No. 460-F Tube Bender

Write for the 1937 Imperial catalog covering refrigeration and air conditioning specialties

IMPERIAL *Tube Benders*

VALVES • FITTINGS • TOOLS • CHARGING LINES • FLOATS • STRAINERS • DEHYDRATORS

is accomplished by means of a vertically mounted motor driven circulator, and is constant as long as one or more kegs are on hand. Proper temperature is automatically maintained by means of a thermostatically operated control. Water temperatures may be varied by the use of a hand operated cold control which is standard equipment. The water cooler is heavily insulated with Frigidaire special insulation insuring minimum heat loss and low operating costs.

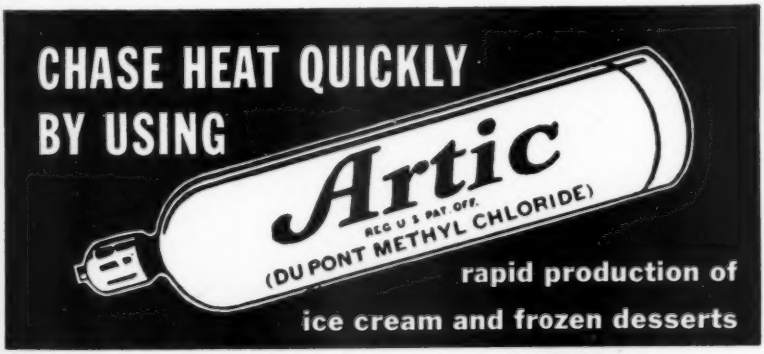
No walk-in coolers or cabinets of other type are required in connection with the Direct Draw System.

There is nothing to clean in the built-in keg coils since they will contain no brine or other injurious solution. Only clean sweet water, cooled to the proper temperature, is admitted to these coils. Made of aluminum, they are light in weight, though extremely rigid, and are attached to the keg head by a three point suspension. The tubing extends from top to bottom of the keg, thus insuring adequate cooling regardless of the amount of beer standing in the keg. Their overall design is such that the brewery experiences no interference in the regular cleaning or pitching process.

Among the several advantages claimed for the system is that it permits the continuous serving of the ideal glass of beer that brings customers back time and again. This is due, it is claimed, to the precise control of correct temperatures made possible by the cooled tap rod and other features incorporated in the system, and the creamy, full bodied draw with real brewery tap room flavor in every glass, made possible by the fact that here even beer has the advantage of being literally "drawn from the wood," with a minimum of disturbance.

Savings to the retailer are claimed to accrue through the elimination of waste. The Direct Draw tap rod faucet is equipped with a special foam control lever which permits a smooth, even flow of beer with a proper sized head in every glass. Waste beer through combing is practically eliminated. There is said to be no further necessity to tolerate the losses represented by wild or flat beer, stale beer, sour beer, morning beer or other problems that confront the beer retailer whose dispensing equipment cannot insure him against such losses.

The new system was added to the Frigidaire commercial line of equipment after an exhaustive series of tests under a variety of conditions.



HIGH latent heat of ARTIC and other valuable thermodynamic properties contribute toward the quick freezing and quick cooling so essential for production and preservation of dairy products.

DU PONT
REG. U.S. PAT. OFF.

E. I. du Pont de Nemours & Co., Inc.
The R. & H. Chemicals Dept.
Wilmington, Del.
District Sales Offices: Baltimore, Boston, Charlotte, Chicago, Cleveland, Kansas City, Newark, New York, Philadelphia, Pittsburgh, San Francisco

ARTIC - *the preferred Methyl Chloride for Service Work*

MINNEAPOLIS-HONEYWELL ANNOUNCE DEATH OF W. R. SWEATT

WE regret to announce the death of William R. Sweatt, founder and former head of the Minneapolis-Honeywell Regulator Company.

Mr. Sweatt, one of the pioneers in the field of automatic controls and control systems for heating, ventilating and air conditioning, died October 12 at the age of 71, in Minneapolis. He had been ill since last December.

Born in Mitchell, Iowa, Mr. Sweatt was educated in the public schools there and at Shattuck School in Faribault, Minn. He early became interested in the field of heat regulation, helping develop much of the first equipment in use.

His first company was the Electric Thermostat Co., which was formed in Minneapolis in 1885, with Mr. Sweatt as secretary-treasurer. That company later became the Minneapolis-Heat Regulator Co., and in 1927, the Minneapolis-Honeywell Regulator Co.

W. R. SWEATT

Mr. Sweatt was named president of the company in 1893 and retained that position until 1927, when he became chairman of the board of directors. He retired in 1933 and moved to Florida to establish his residence on Sea Breeze Avenue, Palm Beach.

Under his active supervision Minneapolis-Honeywell made countless contributions to the field of automatic controls and control

FOR COMMERCIAL USE

Mills Compressors

★ Mills Novelty Company
4100 Fullerton Avenue, Chicago, Illinois

SOLD ONLY THROUGH SERVICEMEN, DEALERS, AND DISTRIBUTORS

systems. Among these are clock thermostat control, limiting devices and electric safety devices, recycling instruments and numerous others. Minneapolis-Honeywell during his time flourished from a small local organization to one of world-wide proportions and reputation.

Besides his wife and two daughters, Mr. Sweatt is survived by two sons, Harold W. Sweatt, who has been active head of the business since his father's retirement in 1933 as president of Minneapolis-Honeywell, and Charles B. Sweatt, vice-president of the firm in charge of sales.

We know the industry will likewise regret the passing of Mr. Sweatt who had a host of friends throughout the field of automatic heating, ventilating and air conditioning.

FRED SINTES, JR., DISTRICT MANAGER FOR GILMER CO.

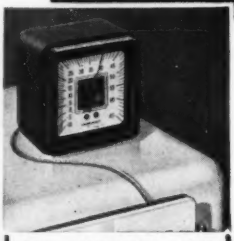
THE L. H. Gilmer Co. announces the appointment of Fred Sintes Jr. as District Manager for Louisiana, Mississippi and Arkansas, on the company's line of belts for domestic and commercial refrigerators, and for household washing machines, pumps and similar drives. Mr. Sintes' headquarters will be in New Orleans.

NEW OPEN-SIDE TUBE BENDER

A NEW one-piece, open-side tube bender, which is designed to slip over the tubing quickly without adjustments and which can be used to make bends at the end or at any part of the tubing, has been announced by The Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago, Ill. It is not necessary to thread the tubing through this bender, it is stated, and this makes it especially handy in cramped quarters where tubing has been partially connected. In such instances bends may be made on protruding ends of tube without disturbing the portion already installed.

Bender is available in different sizes to take tubing from 3/16 inch O.D. to 3/8 inch O.D. and bends can be made to any angle

Mrs. Jones is AMAZED!



THE very idea that a little square box set on top of the refrigerator will show the exact inside temperature with the door closed, amazes Mrs. Jones . . . and if you are on your toes you can cash in on this understandable human curiosity in a variety of ways.

Just add a Marsh "Serviceman" to your kit and you will be surprised how easy it will be to convince Mrs. Jones that her refrigerator needs a complete overhauling or that the refrigerator you have just installed is the best ever. It's designed for all service jobs—checking switch action, answering complaints of too high or too low temperatures—checking brine tanks and vessels, servicing household refrigerators, commercial boxes, cold storage jobs.

Here is a precision instrument, and yet the net price is only $5.00 F. O. B. Factory. Call your jobber and try out one of these Marsh "Serviceman" thermometers. You will then understand why hundreds are saying that it's the biggest $5.00 worth they ever bought.

T'S ACCURATE AND STAYS ACCURATE

The "Serviceman" is guaranteed within one degree. If it is knocked out of adjustment you simply place the bulb in cracked ice and water and turn the patented Marsh "Recalibrator" screw until the pointer reads 32 deg. The thermometer will then be right at every point on the dial.

Marsh "Serviceman" is built in ranges of —10 deg. to +65 deg. F. or —10 deg. F. to +100 deg. F. Also minus 20 deg. temperature range at slightly higher price. Plenty of capillary tubing for reaching any desired point of testing.

JAS. P. MARSH CORPORATION
2059 Southport Ave., Chicago

MARSH "Serviceman"
REFRIGERATION THERMOMETER
—reads temperature with the door closed

NEW OPEN SIDE TUBE BENDER.

up to 180 degrees. The bending form is calibrated to show degree positions so that it is a simple matter to make duplicate bends at any desired angle.

Bender is constructed of steel and is said to be very rugged and durable. It is designated as Imperial No. 364-F. Prices range from $2.95 to $3.75 for the different sizes.

GUSTAVE A. LARSON CO. SHOWS RAPID GROWTH

IN the short span of one year another page has been written in the history of successful refrigeration jobbers news.

Over the entire states of Wisconsin, Illinois, and Iowa, the dealers and servicemen are very rapidly becoming acquainted with the Gustave A. Larson Co., and their policies of serving, helping, and giving all possible advantages to the servicemen.

Their rapid growth has been due to years of experience as servicemen in the field studying the needs and requirements of the servicemen from all angles before entering the business to help the men who do the work. First, by having superior quality merchandise, which saves time; second, prompt deliveries which save time; third, quantity buying which saves money; fourth, personal help and advice by trained field men—which saves time and money—they all spell greater net profits for the serviceman.

No wonder servicemen and dealers turn to Madison, Wis., and to Rockford, Ill., when they want quality supreme and service unequaled as found at the Gustave A. Larson Co.

UNIVERSAL COOLER EVAPORATOR SALES UP

SALES of Universal Cooler evaporators on contract to other manufacturers of household electric refrigerators reached a new high this month, according to F. S. McNeal, president. Orders already re-

Better Play Safe with Cesco HEALTH GUARD FUME KIT

Mask and cartridges for all refrigerants in handy carrying case

A serviceman never knows when fumes may be encountered. Sometimes he finds a bad leak, where a mask is urgently needed at once. This CESCO HEALTHGUARD FUME KIT is light—compact—inexpensive—handy. The mask is adjusted in a jiffy—and should be used in even the mildest concentration of ammonia, sulphur dioxide or methyl chloride. *Write for literature.*

CHICAGO EYE SHIELD CO.
2341 Warren Boulevard
CHICAGO, ILL.

ceived for 1938 production more than double the total number manufactured in 1937, Mr. McNeal said. As a result of this increased demand, Universal Cooler is completing an expansion program that includes added equipment and finer inspection facilities.

The 1938 Universal Cooler evaporator, which has been greatly improved in appearance and performance, is of the dry system, direct-expansion type with top-mounted thermostatic expansion valve. The exterior is aluminum and the interior copper, electro tin plated. Continuous ⅜ inch copper tubing, metallically bonded above and below each tray shelf speeds freezing of ice cubes and desserts.

CARRIER OFFERS NEW "REACH IN" REFRIGERATOR

PRODUCTION of a new, self-contained "reach in" refrigerator for commercial and large residence use has been started by Carrier Corporation, Syracuse, N. Y., L. R. Boulware, vice-president and general manager, announced today.

This is the latest product marketed by Carrier, Mr. Boulware stated, and is the result of extensive research on the use of air conditioned refrigeration. It is built for use in hospitals and other institutions, restaurants, small stores, and large residences. There are 35 cubic feet of space.

There is no installation cost as it is plugged in on an electric outlet. An exclusive forced convection system developed by Carrier supplies the refrigeration. This equipment is below the compartments.

Other Carrier air conditioned refrigeration equipment includes display cases in several models. All of these are self-contained and require no installation.

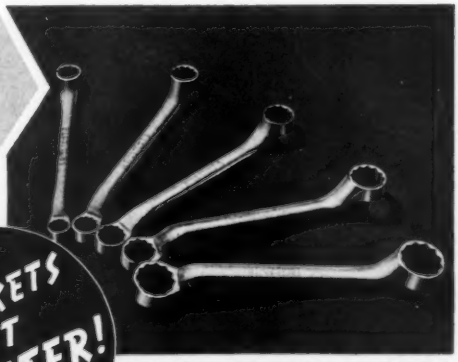
ANNOUNCES SOLDER FOR STAINLESS STEEL, ALUMINUM, CAST IRON

THE repair of evaporators of stainless steel, a service job which heretofore has caused considerable trouble, is one of the applications listed for the new high-tensile strength solder and all-metal flux which have just been announced by The Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago, Ill. The solder is for use with aluminum, stainless steel, monel, cast iron, zinc base die castings, copper, brass and other metals.

It is stated that while this solder is ap-

Snap-on

SPECIALIZED TOOLS FOR REFRIGERATION SERVICE



• Double-broached Boxocket walls give double the gripping points of an end wrench—require only half the space for handle movement.

The XS-5 set illustrated is a most practical assortment of Dwarf Boxockets for ten nut sizes ranging from ⅜" to ¾" inclusive.

Every tool kit needs this complete set. Once you use them, you'll wonder how you worked without them. Available only through our own branch distributing warehouses located in 37 principal cities. See Snap-on Tools, Inc., in your telephone directory or send coupon.

SNAP-ON TOOLS, INC., Kenosha, Wis.

BOXOCKETS DO IT BETTER!

SNAP-ON TOOLS, INC.
KENOSHA, WIS.

☐ FREE special literature on refrigeration tools; also 136 page catalog.

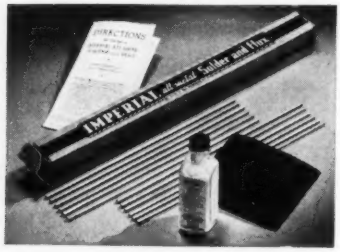
☐ Show me XS-5 Boxocket Set.

NAME .....

ADDRESS .....

..... RSE-11

plied at low temperatures only slightly above those used for ordinary soft solders, it will provide a bond with a tensile strength many times as great. Uses in refrigeration service work are said to include assembly of tubing to evaporators, repair of stainless steel evaporators and other evaporators, repair of compressor tubing connections, and repair of ice trays. Joining pieces of sheet or cast aluminum, joining aluminum and copper, aluminum and stainless steel and similar applications can be readily accomplished.



IMPERIALS NEW SOLDERING KIT.

The solder is designed for use in connection with the special flux which is furnished in conjunction with it, the flux being used to dissipate the oxides on the surface of the metal preparatory to the application of solder. Blow torch, welding torch or large soldering iron can be used for applying the solder and flux. Solder melts at approximately 500 degrees F.

The new product is known as Imperial All-Metal Solder and Flux and is sold in kits which contain solder, flux, emery cloth and directions. Kits range in price from $1.75 to $5.00. It also is sold by the pound.

COPELAND REFRIGERATION CORPORATION MOVES PLANT TO SIDNEY, OHIO

MR. DALLAS E. WINSLOW, president of Copeland Refrigeration Corporation, today issued the following statement.

"During the past year the Copeland Refrigeration Corporation with its own factory controlled distributor and dealer selling organization has strengthened its position immeasurably in the refrigeration industry. This growth of dealer organization throughout the entire country speaks well for the

$500,000 GENUINE
MAJESTIC-GRIGSBY GRUNOW
REFRIGERATOR & RADIO PARTS.
FOR ALL MODELS PRIOR TO 1936.
Majestic
UNITS GUARANTEED 18 MONTHS.
SEND FOR CATALOG. G & G GENUINE MAJESTIC REFRIGERATOR & RADIO PARTS SERVICE.
5801 W. Dickens Ave., Chicago, Ill.

REPLACEMENT GASKETS
FOR ALL MAKES
Metallic Gaskets that hold regardless of what the refrigerant may be and will not shed particles of material to clog up important working parts in a machine.
Send for catalog listing many "orphans" not available elsewhere.
CHICAGO-WILCOX MFG. CO.
7761 S. AVALON AVE., CHICAGO, ILL.

AIR CONDITIONING AND REFRIGERATION
"KEEPING STEP WITH INDUSTRY"
That is the function of this reliable school that prepares men properly for the Air Conditioning and Refrigeration field.
A resident school that meets every requirement of the industry in its practical and technical training. Superbly equipped—9000 square feet of laboratories and classrooms. Day and Evening Courses. Request Booklet T.
Attention Employers!
CALL ON US FOR THE MEN YOU NEED! OUR FILES OF COMPETENT MEN ARE AVAILABLE. NO FEES TO EITHER EMPLOYER OR EMPLOYEE. . . .
TECHNICIANS INSTITUTE
244 WEST 14th STREET NEW YORK

further development of the Copeland market for 1938.

"The Copeland plant is now being moved to Sidney, Ohio, to provide for the combining of Prima Manufacturing Corporation and its organization with the Copeland organization. This combination will not only strengthen the position of both companies in the electrical appliance market but also contribute to the increased profit possibilities for each Prima and Copeland dealer throughout the United States.

"Sidney, Ohio, is centrally located as to sources of supply for materials and at the same time provides excellent shipping facilities for service to our dealer organization.

"Not only have Copeland and Prima improved their position in the industry during the past year but in addition new lines have been added, such as water coolers, electric ranges, and the increasing of our facilities so as to provide up to 15 hp. in the commercial field.

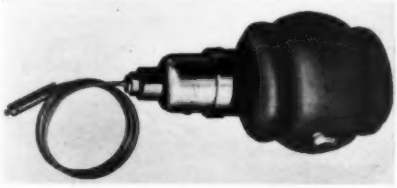
"The Series 38 models in 4, 5, 6, 7 and 9 cubic foot sizes are now available and will provide our dealer organization with an excellent product to sell at a price that should stimulate a heavy demand in the face of general market increases."

DETROIT NO. 735 ANTI SWEAT-ER FOR THERMOSTATIC EXPANSION VALVES

WHEN Thermostatic Expansion Valves are so installed that they are exposed to room temperatures they are prone to frost up or sweat.

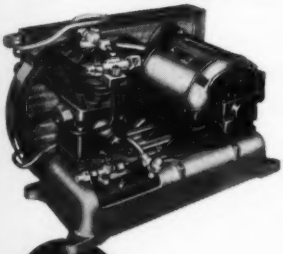
To prevent this condition they are now supplying a No. 735 Anti Sweat-er which will fit either the No. 673 or No. 674 Thermostatic Expansion Valve as manufactured by Detroit Lubricator Company.

The Anti Sweat-er is molded of specially treated composition to tightly fit the valve body and prevent the possibility of air pockets. It is split on one side only, thus making it quickly and easily applied—even to those valves already installed. Grooves are molded



DETROIT'S ANTI SWEAT-ER

for Service Replacement & New Installations



M & E Bare Compressors and complete units, available with or without motors and controls, meet every need of the Assembler or Service Company with high quality, moderately priced.

One, two and four cylinder models for SO_2, CH_3CL and F-12. 1/6 h.p. to 20 h.p.

Write for new catalog — a valuable reference.

M&E EST. 1865

MERCHANT & EVANS COMPANY

Philadelphia, Pa., U. S. A., Plant at Lancaster, Pa.

in top and bottom providing a simple aid when attaching to the valve. The Anti Sweater can be held in place by tying with soft wire or waxed cord.

S S S

NEW "MIDGET" ELECTRIC SOLDERING PLIERS

IN answer to the increasing demand for a smaller low capacity soldering unit, that would heat electrically, sweat joints without unsweating adjacent connections, and eliminate the open flame hazards, the Ideal Commutator Dresser Co., 1093 Park Avenue, Sycamore, Ill., has introduced the new No. 2 "Midget" Type Thermo-Grip Pliers.

This tool has been designed especially for soldering small objects and for work in restricted spaces and for ease of operation. A few typical applications are: For soldering small lugs and terminals up to 150 amp., in close quarters on switchboards, motors, generators—for various small radio and appliance soldering—for sweating joints on small copper tubing and fittings up to 3/8 inch diameter.

The small power requirement (300 watts) permits the use of the unit on any standard lighting circuit without danger of overloading the circuit or burning out fuses.

The pliers are made of cast bronze (long, slender, small jaws), so that they will fit into restricted spaces. The jaws are hinged at the back and have a spring, which holds them normally in the open position.

Further information can be obtained by writing the manufacturer.

S S S

THE SYNTRON SHAFT SEAL

ONE of the most interesting exhibits at the big convention of the R.S.E.S. in the Stevens Hotel, Chicago, Ill., was the new Syntron Shaft Seal, manufactured by the Syntron Company, Homer City, Pa.

The Syntron Seal is designed to eliminate friction of the seal face where it contacts the revolving shaft.

Since these two surfaces must run in a dry condition in order to effect a tight seal, it is apparent to the careful observer that no lubrication in liquid form can be induced between the shaft shoulder (or collar) and the seal face against which the shaft shoulder revolves, regardless of the amount of oil

Manufacturers' Surplus Refrigeration Supplies

Write for our price saving challenger

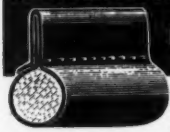
We also carry a complete line of nationally advertised refrigeration parts, tools and supplies.

We sell to service men only

REFRIGERATION PRODUCTS, Inc.
2521 N. Crawford Ave., Chicago, Ill.

MOTOR BRUSHES BEARINGS BUSHINGS
SHIPPED THE SAME DAY
WM. F. MAGUIRE CO.
ELECTRICAL SPECIALTIES
128 No. Clinton St. Tel. Randolph 9117
CHICAGO

DENNIS GASKETS
FOR ALL MAKES REFRIGERATOR DOORS



A complete line of rubber - coated, packed Gaskets and extruded rubber Gaskets that last longer —retain higher efficiency—because made of finest materials and workmanship. Write for free samples, giving your jobber's name and address.

W. J. DENNIS & CO.
2110-20 WEST LAKE ST. ··· CHICAGO

Consider BLYTHE *your Stock Room*
Immediately available to supply your refrigeration and air conditioning supplies — wholesale only.

PARTS A complete line of standard parts carried in stock at all times
TOOLS Everything you need to do a better and faster repair job
SUPPLIES The best there is on the market. Write for catalog

H. W. BLYTHE CO.
2334 S. Michigan Ave., Chicago

surrounding these vital parts which must be of necessity a perfectly tight union.

The Syntron Seal has for a seal face, parallel metal rings concentric with the shaft. The space between the rings is filled with a special sealing ring processed into and bonded with the aforementioned parallel metal rings. This special sealing ring is made of micro-fine lubricating graphite and assumes the job of sealing the shaft against leakage and is self lubricating, regardless of pressures on the seal.

A very sturdy and reliable method of supporting the self-lubricating seal ring is featured in this new seal by Syntron.

\$ \$ \$

GENERAL CONTROLS CO. OPENS CHICAGO OFFICE

A NEW branch office has just been opened in Chicago by the General Controls Co., manufacturers of automatic temperature, pressure and flow controls. Complete stocks and service and engineering facilities will be maintained.

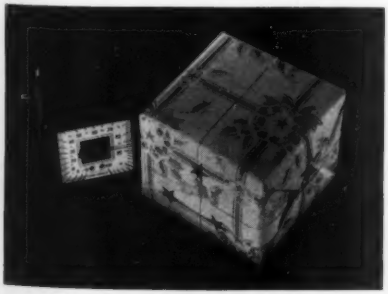
According to Mr. A. W. Ray, vice-president in charge of sales, the company now offers full stocks as well as engineering facilities in four direct factory branches in New York, Chicago, Cleveland, and San Francisco, with distributors in all principal cities.

The new Chicago office, at 450 East Ohio Street, will be under the management of H. G. Wasserlein, graduate engineer.

\$ \$ \$

SUGGEST REFRIGERATION SERVICE THERMOMETER AS GIFT

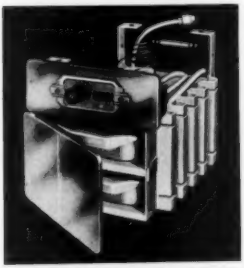
AT the exhibit in connection with the R.S.E.S. Convention, Jas. P. Marsh Corporation displayed their "Serviceman" Re-



THE MARSH THERMOMETER AS A GIFT.

KRAMER

DOMESTIC ICE CUBE MAKERS



UNIVERSAL SUSPENSION
With Fluted Walls, Extra Surface for Maximum Humidity.

TRENTON AUTO RADIATOR WORKS
NEW YORK TRENTON N.J. PITTSBURGH

ALCO ENGINEERED

ALCO'S ATOMIC HYDROGEN WELDED POWER ASSEMBLY GIVES LONGER VALVE LIFE

ALCO VALVE CO., INC.
2630 Big Bend Blvd.
St. Louis, Mo.

Write for New Catalog of
PARTS·SUPPLIES·TOOLS
for REFRIGERATION *and*
AIR CONDITIONING
Complete Stock—Quick Service—
Money-saving Prices
EVERYTHING YOU NEED FROM ONE SOURCE
AIRO SUPPLY CO. CHICAGO: 2732 N. ASHLAND AVE.
NEW YORK: 17 W. 60th ST. (at Broadway)

frigeration Service Thermometer in an attractive Christmas package as a suggested present for those who service or operate refrigeration equipment. The thermometers are supplied, packed as a gift at no extra cost.

"The idea has proved quite popular," said an official of the Marsh Corp. "—and why not? It costs no more than a box of cigars and is a permanent reminder of the giver."

For firms buying quantities, the thermometers are also imprinted, without extra charge, with the name of the donor.

SNAP-ON INTRODUCE NEW FOUR-IN-ONE WRENCH

ANNOUNCING the addition to their line of a new four-in-one refrigeration ratchet wrench, Snap-On Tools Inc., of Kenosha, Wis., state the following:

Used for various size valve stem couplings and general refrigeration service work, this wrench has two ratcheting ends of ¼ inch and ⅜ inch square openings. The ratcheting action is reversible so that the tool can be used in either direction without removing it from the job.

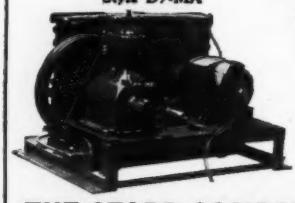
THE NEW TOOL PRODUCED BY SNAP-ON.

On the center of the wrench are two openings, one 3/16 inch square, and ½ inch hexagon, and the tool itself is used as a tee handle when using these two sizes. Wrenches containing these sizes are constantly needed by refrigeration service men, and the convenience of having all four sizes on one handle must be experienced to be appreciated.

RESULTS OF BORG-WARNER CONTEST

ONE of the features of the recent Refrigeration Service Engineers Society Convention was the guessing contest conducted by the Borg Warner Service Parts Company. A large glass bowl was nearly filled with Mueller and Weatherhead fittings.

Condensing Unit
Style D7-MA



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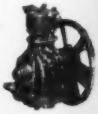

Compressor
Style J

THE STARR COMPANY, Richmond, Ind., U. S. A.
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2025—1st Ave. North Birmingham, Ala.
1222 Huron Road Cleveland, Ohio

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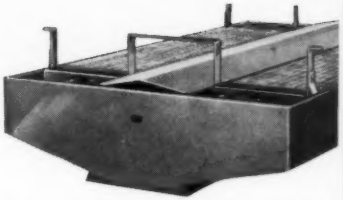


REMPE COMPANY

340 N. Sacramento Blvd., CHICAGO

and over 1,500 individuals attempted to guess the number in the container.

"Guesses ranged from 320 to 53,900," Ray P. Johnson, manager of the Refrigeration Parts Department of the Borg Warner Service Parts Company, stated, "but when the fittings were counted by Mr. H. W. Blythe and Mr. Don Tmey, the correct number was found to be 1,388."

Winner of the $50.00 prize was Mr. William V. Warner, 959 Fuller, St. Paul, Minnesota, with a guess of 1,380 fittings.

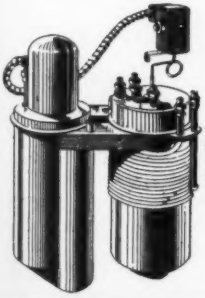
MINNEAPOLIS-HONEYWELL ANNOUNCE NEW CATALOGUE

THE Minneapolis-Honeywell Regulator Company recently released to the heating, ventilating and air conditioning field a new edition of its Condensed Catalogue and Price List. This publication which is forty-eight pages in size contains a complete arrangement of all Minneapolis-Honeywell controls and control systems including its new National pneumatic controls and Brown indicating, recording and controlling instruments. Several new price changes and instruments have been included with this printing among which are the new Minneapolis-Honeywell Types V435 and V835 Magnetic Gas Valves, Packless Seal Water Circulator, Angle Flow Valve and the newly designed National Pneumatic Thermostats and Humidity Controllers.

Classified Ads

Rate: One Dollar for thirty words or less. 20 cents for each additional ten words or less.

SERVICEMEN AND DEALERS SAVE MONEY. Buy "used as is" refrigerators. Spray and recondition them yourself. Kelvinators $12.00; Frigidaires $15.00; Copelands $14.00; Bohn $14.00; General Electrics $15.00; Majestic $12.50; Electroluxes $22.50; others $10.00. Close-out ten 1936 Stewart-Warner 5½ cubic foot refrigerators $84.75 each; six 6½ cubic foot $94.50 each. Frigidaire units "as is" ¼-hp. single-cylinder $12.50 each; double-cylinder $15.00 each. Pilgrim Refrigeration Co., 45-33 50th St., Woodside, L. I., New York.



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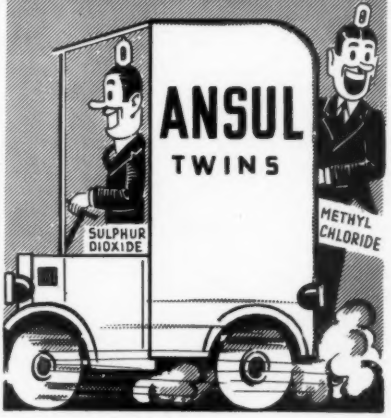

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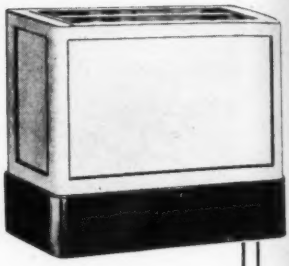

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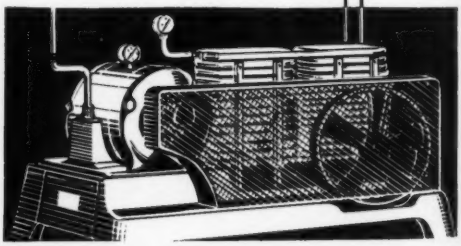

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